Vol. 91, No. 23 New York, June 9, 1928 *Pages 1181-1276*

L. W. W. MORROW, Managing Editor
EARL WHITEHORNE, Commercial Editor
ALLEN M. PERRY, Associate Editor
G. F. WITTIG, Statistical Editor
H. M. CAMERON, Financial Editor
F. C. WELLS, News Editor
EUSTACE C. SOARES, Manufacturing and Markets Editor

Electrical World

The consolidation of Electrical World, Electrical Engineer and American Electrician

W. H. ONKEN, JR., *Editor*

FRANK R. INNES and T. P. KINDIG, Western Editors, 7 South Dearborn St., Chicago
H. S. KNOWLTON, New England Editor, 88 Tremont St., Boston
WALTER C. HESTON, Pacific Coast Editor, 883 Mission St., San Francisco
E. R. SHARLES, Assistant Editor
PAUL WOOTON, Washington Correspondent, National Press Bldg., Washington

Contents of N.E.L.A. Report Issue

Editorials 1181

Frontispiece—*Preston S. Arkwright*.....1184

Public Understanding the Keynote.....1185

President Sands' Address.....1191

Industrial Public Policy—*By R. H. Ballard*.....1196

Statements to Think About.....1198

Golden Rule Relations—
By J. F. Owens.....1200

Investment Diversification Good—
By Dean John T. Madden....1202

Utilities and the Public—
By Henry G. Wells.....1203

Reducing Insurance Costs—
By Charles B. Scott.....1205

Electrification Surveyed—
By Britton I. Budd.....1207

Extend Rural Service to 21,217 Farms—*By C. F. Stuart*.....1210

N.E.L.A. Answers Propaganda Charges 1211

Service the Answer—
By Melvin A. Traylor.....1212

The Power Industry in the Marketplace—*By James H. McGraw*.1215

Water-Power Development—
By Paul A. Schoellkopf.....1218

Why the Investment Company....1220

Industry and Business Schools—
By Deane W. Malott.....1221

Utility Women Help—*By Miss Sophia Malicki*.....1223

Radio and the Power Industry—*By H. P. Davis*.....1225

Rate Situation Discussed—*By Edwin Gruhl*.....1226

Coffin Award for 1928 1228

Allocation of Sales Costs—*By E. W. Lloyd*.....1230

Importance of Accounting—*By E. A. Davis*.....1233

News and Interpretation of N.E.L.A. Convention

The National Electric Light Association convention closed yesterday morning, and *Electrical World* readers will find in this issue a complete report of this most important assembly.

The staff went to the convention last Sunday and through day and night hours worked unceasingly to present to *Electrical World* readers the news of the convention, a report of all addresses and an editorial interpretation of the activities. Only those engaged in the printing and editorial business realize the labor, the skill and the organization facilities required to do this job.

The work was done because the editors believed they could render no more important service to the light and power industry. They present this issue to their readers in this spirit. They are human enough to like recognition for doing their best, but are wise enough to find their chief incentive for the task in the hope that the contents of this issue will be beneficial to the progress of the industry they serve.

Railway Electrification—
By L. A. Downs.....1235

Lighting Service Committee Work—*By J. Daniels*.....1237

Call to Arms in Sales Work—
By J. E. Davidson.....1239

Farmers Machinery-Minded—
By Clifford V. Gregory.....1245

Thunder and Lighting—
By Clayton Rand.....1246

Good Merchandising Practice—
By Oswald W. Knauth.....1247

What's New About Lamps—
By Frank W. Smith.....1249

Engineers for Economy—
By E. C. Stone.....1251

Codes and Standards—
By Irvin W. Day.....1254

National Engineering Work—
By H. S. Bennion..... 1255

Government in Industry—
By John E. Edgerton.....1258

Private Ownership Gives Service—
By Franklin T. Griffith.....1259

News of the Week 1260

McGRAW-HILL PUBLISHING COMPANY, INC., Tenth Ave. at 36th St., NEW YORK, N. Y.

JAMES H. McGRAW, President
JAMES H. McGRAW, Jr., Vice-Pres. and Treas.
MALCOLM MUIR, Vice-President
EDWARD J. MEHREN, Vice-President
MASON BRITTON, Vice-President
EDGAR KOBAK, Vice-President
C. H. THOMPSON, Secretary

NEW YORK District Office, 285 Madison Ave.
WASHINGTON, National Press Building
CHICAGO, 7 South Dearborn St.
PHILADELPHIA, 1600 Arch St.
CLEVELAND, Guardian Building
ST. LOUIS, Bell Telephone Building
SAN FRANCISCO, 883 Mission Street
LONDON, 6 Bouverie Street, London E. C. 4

Cable Address "Machinist, N. Y."

Publishers of
Engineering News-Record — American Machinist
Power — Chemical and Metallurgical Engineering
Coal Age — Engineering and Mining Journal
Electrical Merchandising
Ingeniería Internacional — Electric Railway Journal
Bus Transportation — Construction Methods
Electrical World — Radio Retailing
Electrical West
(Published in San Francisco)
American Machinist—European Edition
(Published in London)

Member Audit Bureau of Circulations
Member Associated Business Papers, Inc.

Circulation of this issue, 19,250

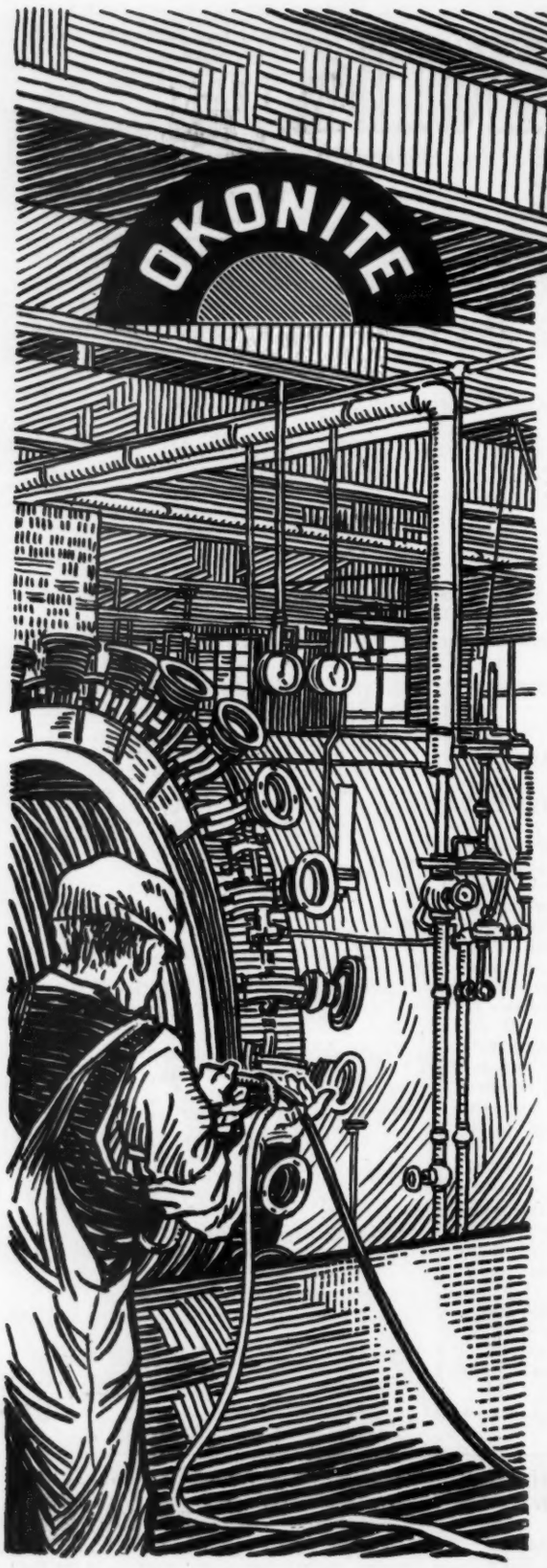
The annual subscription rate is $5 in the United States, Canada, Mexico, Alaska, Hawaii, Philippines, Porto Rico, Canal Zone, Honduras, Cuba, Nicaragua, Peru, Colombia, Bolivia, Dominican Republic, Panama, El Salvador, Argentina, Brazil, Spain, Uruguay, Costa Rica, Ecuador, Guatemala, Haiti and Paraguay. Extra postage to other countries $4 (total $9 or 38 shillings). Subscriptions may be sent to the New York office or to the London office. Single copies, postage prepaid to any part of the world, 25 cents.
Change of Address—When change of address is ordered the *new* and the *old* address must be given. Notice must be received at least ten days before the change takes place.

Copyright, 1928, by McGraw-Hill Publishing Company, Inc.

Published weekly

Entered as second-class matter Jan. 20, 1907, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

Advertising Index—Alphabetical, 194; Classified, 186, 188, 190, 192; Directory of Engineers, 112, 113; Searchlight Section, 114-119



Vulcanization that Preserves Insulation

WHEN vulcanized by ordinary methods, rubber insulation tends to swell. As stated in our previous advertisements, however, Okonite insulation is applied to the wire with a backing of tin. The tin backing, folded around the conductor, forms a rigid mould which holds the insulating compound and prevents swelling during the process of vulcanization. This is again an exclusive Okonite process. It provides greater density, longer life, greater tensile strength and improved electrical qualities in Okonite Rubber Insulated Wires and Cables which, for half a century, have been recognized as the outstanding products in this field.

The Okonite Company

The Okonite-Callender Cable Company, Inc.

Factories: PASSAIC, N. J. PATERSON, N. J.

Sales Offices: NEW YORK CHICAGO PITTSBURGH ST. LOUIS ATLANTA BIRMINGHAM SAN FRANCISCO LOS ANGELES SEATTLE

General Electric Supply Corporation, Boston, Mass.
Novelty Electric Co., Philadelphia, Pa.
F. D. Lawrence Electric Co., Cincinnati, O.

Canadian Representatives:
Engineering Materials Limited
Montreal

Cuban Representatives:
Victor G. Mendoza Co.
Havana

OKONITE

OKONITE PRODUCTS

OKONITE INSULATED WIRES AND CABLES
OKONITE INSULATING TAPE
OKONITE CEMENT
VARNISHED CAMBRIC CABLES
MANSON & DUNDEE FRICTION TAPE
OKOCORD
OKOLOOM

OKONITE-CALLENDER PRODUCTS

IMPREGNATED PAPER CABLES
SUPER-TENSION CABLES
SPLICING MATERIALS

Electrical World

McGraw-Hill Publishing Company, Inc.
JAMES H. MCGRAW, *President*
EDGAR KOBAK, *Vice-President*

W. H. ONKEN, JR.
Editor

VOLUME 91 — *New York, Saturday, June 9, 1928* — NUMBER 23

The N.E.L.A. Convention in Perspective

THERE was a great gathering of public utility executives at Atlantic City this week. Leading men came from all sections of the country seeking information and advice. They had heard rumblings of the investigation being conducted by the Federal Trade Commission and had read garbled reports of the doings of state committees on public utility information. What was to be the answer of the electric light and power companies of the country to these accusations and insinuations? Was the industry to be damned by distorted publicity and remain dumb?

From the beginning to the end of the convention the answer to these questions was forthcoming. The National Electric Light Association, through its president, its public policy committee and its chief executives, spoke. The industry found its tongue and gave voice to its policy on public information. It announced from the housetops that it will use all proper channels for the diffusion of information concerning the electric light and power business. It accepted full responsibility, openly avowed, for its every word and act. It asked only that it be not condemned merely for speaking at all, or told that it has no right to defend itself in the press or to protest against false statements in the schools. It is willing that its own declarations be disregarded along with intemperate criticism leveled at it, and that it be judged alone by its proved accomplishments and indisputable acts. On these, it declared, public praise or condemnation must be based.

THIS was the note struck at the convention that rang above all others. But there were many more. In this issue of the ELECTRICAL WORLD is printed the articulate evidence that the light and power industry is going forward rapidly and is setting still higher standards for all its activities. It is improving its service through the development of the art, the perfection of its organization and the expansion of its facilities. The announcement that it has contributed $3,000,000 to the National Research Council program shows how it cooperates in well-considered plans for public benefit. Many able addresses traced the evolution of industry and showed how the investment and holding company is a logical agency for the conduct of utility business which has for its ultimate object better and cheaper service.

In all the meetings there was evidence of intense interest in every possible method to make the electrical industry more efficient. The commercial men have made positive strides in their work. They have a national sales program, a national sales policy which calls for cooperation, a national selling platform which has tangible planks on credit, advertising and sales prices, and in addition a balance-sheet policy which measures costs and returns. The engineers are trying to get more efficiency in capital expenditures and are using more foresight in system building. The accountants are becoming executive aids, and the public relations committees are trying to carry out tangible projects which will develop a nation-wide conception of the advantages of electric service and give the public a knowledge of utility affairs. No one can read the record presented in this issue without getting to know an industry which is wide-awake, busy, progressive and alert to every opportunity to adapt itself better to national service; but one must have mingled with the eight thousand electrical men at Atlantic City to get the inspiration, enthusiasm and spiritual values that vitalize the light and power industry of today.

VIEWING the convention in perspective, tracing its growth and conduct, and weighing comments of those who attended it, lead to constructive suggestions for future meetings. The exhibits are found to be a vital part of the convention activities and have become a major objective for many attending. But the convention programs might well develop along lines which would provide more opportunity for utility leaders to tell the rank and file how they are building the industry and in what respects the rank and file can carry out their plans. This would give unity in industry thought and action. There was some comment to the effect that too many papers dealt in self-praise of the industry on the one hand and in fault-finding with the public on the other. It was also remarked that many addresses contained facts and enunciated principles that would be new to a public audience but were well known to utility men. Thus it might be well to devote somewhat less time to so-called publicity-value program material and more time to basic plans for utility progress of a type to instruct and interest the thousands of utility men who attend the meetings. Every year sees a better convention than the preceding one, however, and the lessons learned at this year's convention will afford opportunity to make an even better meeting next year. In the final analysis, the fifty-first convention will mark a milestone in utility progress because it recorded new conceptions of how to win public confidence and demonstrated beyond cavil that the utilities have courageous and far-sighted leaders.

Puget Sound Company Wins Coveted Coffin Award

AWARD of the Coffin medal and prize to the Puget Sound Power & Light Company of Seattle may have surprised many, because the municipal plant of Seattle is being constantly held up to public gaze as a wonderful example of the efficiency of local government in the electric light and power business. However, the record discloses that the Puget Sound company, while it may not have basked in the limelight of publicity, has been busily at work along original lines and particularly active in the farming communities surrounding the metropolis of the Pacific Northwest.

Electricity on the farm is being talked of in many sections; but in the State of Washington it has been made more than a topic of conversation—it is, in fact, a reality. To be sure, conditions on the Pacific Coast are such as to call for much irrigation and pumping of water; but the electric light and power companies of that section have been quick to translate that need into opportunity for rural electrical development and prosperity, and in that respect they are to be congratulated.

Another development of which the Puget Sound company has a right to be proud and which other companies might emulate with profit is the range load which it has succeeded in connecting to its lines. Every heating load from the flatiron up is a sizable load, and although it may entail a low energy rate, if properly developed the range business will be found profitable to the utility and a source of satisfaction to the user. Stone & Webster and the local management at Seattle are to be felicitated on capturing this year the coveted Coffin award. It will, we are confident, spur the company to still greater endeavor and mayhap to the vanquishment of municipal operation in Seattle.

* * * *

Sanity in Competition

TRUSTS and monopolies have been outlawed for more than thirty years by government as repugnant to the fundamental philosophy of a democratic civilization. Government sought to build a large number of industrial units each standing alone and in competition with all other units. Yet economic conditions have developed so rapidly that a rigid adherence to such a philosophy of business cannot be other than a destructive policy, and after much floundering about there is evidence that modern business can be co-operative and yet remain competitive.

This is the day of mass production and distribution. There is competition between groups of industries and between industries. Hand-to-mouth buying is here, as well as modern facilities in banking, communication and transportation. Under the old-time conception of business competition, wherein each individual competitor stands alone, without group credit, market information or data on his group business, he finds himself driven to destructive competition in order to exist. He must seek relief through co-operation. Relief is had by the organization of business groups which pool individual interests and develop a workable machinery for co-operation in competition under the impulse of economic necessities and the guidance of governmental agencies. These groups may be called trade associations, business institutes or other names new to industry, but all operate on the same basic principles.

General Lincoln C. Andrews recently stated these principles as follows: "To promote in the industry a mutual confidence and high standard of business ethics; to eliminate trade abuses; to promote sound economic business customs and practices; to foster wholesome competition; to provide, for individual efficient business management operating independently, an opportunity to do business with an adequate return, and thus generally to promote the service of the industry to the public welfare." If business adheres to these principles in the formation of the mechanisms to give co-operation in competition, there is no doubt of the results. The sea is yet uncharted, but the beacon lights are installed.

* * * *

Accused, but Not Guilty!

WISDOM, vision and the courage to face a difficult and critical situation characterized the utility men who journeyed to Atlantic City this week. Each had local conceptions and methods of thought as a result of some lack of public understanding of the utility business and of recent tendencies in the relations of government to all business. The national business trend toward consolidation, the attempts to get the government into business, the Federal Trade Commission's investigation of the utilities—these united to bring to a climax agitation over public relations both local and national. Utility men came from far and near to counsel together, to offer suggestions, to get suggestions and to prepare plans. They were accused, but not guilty; they had a policy, but not a method, and they wished to guide their local and national business into channels that would bear them toward greater and better electric service.

The light and power industry has an educational problem and must analyze more carefully the thoughts and emotions of the men and women of America. In his address President Sands said: "I have an abiding faith in the integrity and the ability of the American public to deal fairly with our industry once it is possessed of the requisite information for the exercise of intelligent action and the formulation of sound judgment. If we, because of adverse criticism, indifference or for any reason whatsoever, fail to see to it that the public has such information, then we must not blame the public if at times it fails to accord us that measure of justice to which we feel we are entitled." This is the counsel of wisdom and courage.

The industry has learned that public confidence cannot be obtained by passing its public relations responsibilities over entirely to undirected publicity departments. It has learned that good-will advertising can degenerate into braggart advertising very readily. It has learned that organized national good-will efforts must be planned carefully lest they grow into agencies which serve as the permanent repositories of job-holding men without vision. It has learned that the public responds slowly to protestations of virtue and rapidly to proofs of service. The industry has shown the customary human traits of selfishness, inconsistency, egotism and pride of accomplishment and has learned wisdom through these mistakes of omission and commission. Fortunate indeed is the electrical industry that its inexperience in dealing with human values has not led it into serious errors and mazes without exits. At this critical stage of its development it has knowledge gained through experience.

"Public relations" is only a catch phrase to express the desire to have the public believe in electric service

and in those responsible for giving electric service with the same degree of faith that has led men of the industry to devote their talents and money to rendering this service. It takes faith, confidence, loyalty and enthusiasm to make both good business and good public relations. In business, as in everyday human relations, it is the unobtrusive, friendly and sincere carrying out of an unselfish service program that makes for happiness as well as prosperity.

* * * *

Commercial Program Crystallized

FROM the commercial point of view the year just closed has brought significant progress that should encourage and stimulate the men of the sales branch of the power industry. There has been cumulative evidence that commercial purpose is crystallizing in executive thinking. The need for market development has long been discussed in theory. It is now taking more definite shape in a demand for action and the more serious consideration of the need for a balanced program that will evaluate the sales possibilities and the economies of the different classes of load. It might be said that the industry has been for some time groping and fumbling for commercial purpose. Now comes a demand for action.

Attention is focused particularly on the inadequacy of the electrical equipment of the home. Manufacturers, jobbers, contractors and dealers as well as power companies have been coming together in their thinking around this issue. Out of it has come a new spirit of mutuality, a more active desire for a practical co-operation which has expressed itself concretely first in the reorganization of the directorate of the Society for Electrical Development as a council of the industry and second in the calling of the Industry Sales Conference, now at work on the formulation of a broad sales program for the development of the popular market for electric service. President Sands and Commercial Section Chairman Davidson have given generous support and leadership to this movement, and its progress will stand as one of the achievements of this administration.

Impulse has been given to another policy of far-reaching commercial importance. This is an honest and sympathetic effort to effect closer co-ordination between the national associations of the industry. A very practical benefit has also come through the intertrade conference initiated by the merchandise committee with Mr. Greenwood as chairman. Out of this have come the definitions of a set of merchandising principles and standards that have done much to heal the widening breach between the power industry and the retail trades that sell electrical home-load appliances. This is constructive work that should carry forward steadily.

Broadly, action is indicated in four directions: A closer co-ordination of the organized industry for the purpose of going forward with the selling job, a practical attempt to define and reconcile the merchandising policies of the different sales agencies in industry, a more serious consideration of the need for better organization in the industry for sales work, and the growing realization that accurate cost accounting is essential to intelligent market operations. On top of this comes increasing opinion that the electrical industry must invest more money in market development and exert a stronger pressure of advertising in the "new competition." This point was stressed by Chairman Davidson and James H. McGraw before the convention.

It would appear that the period of commercial hesitation is finally at an end. The coming year should bring even more definite purpose and more decisive action in commercial affairs.

* * * *

Substations Passing Out

LOAD growth in the electrical industry keeps engineers and system planners keyed to a high pitch. In larger cities a density is found ranging from 3,000 kilowatts to 300,000 kilowatts per square mile, and this density keeps on creeping upward. A ten-year perspective on load growth gives a new conception of a metropolitan system; it modifies present layouts and makes radical changes necessary.

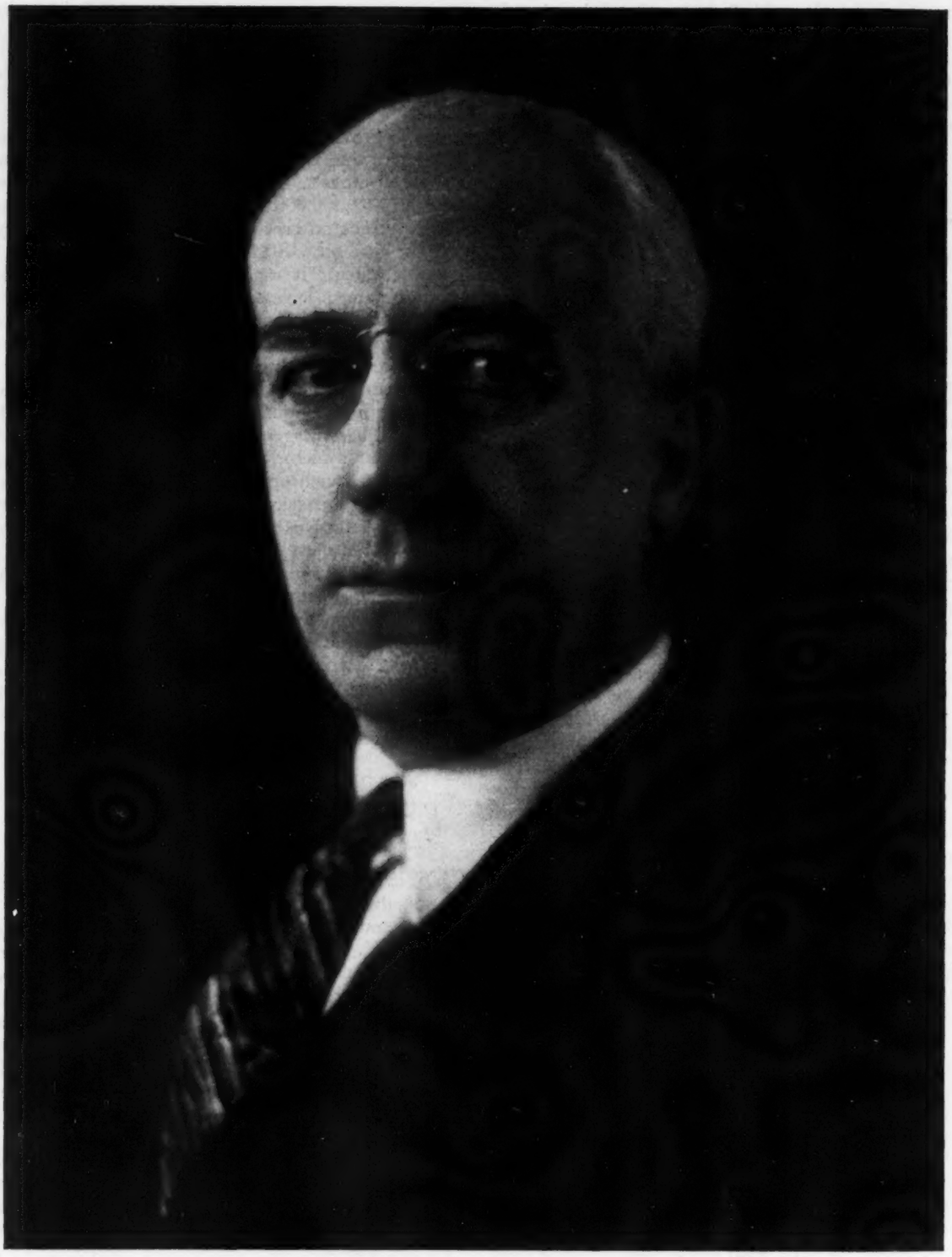
The substation seems to be an expensive and hazardous incumbrance on the metropolitan system of the future which uses alternating current. It has served its time in the system layout and must pass, because it is no longer needed as a functional device. Instead of the substation there will be unit generators, an alternating-current grid distribution system, multiple-transformer vaults underground and synchronizing at the grid. It is a simple and reliable system, because all faults clear themselves if small cables are used to tap the network, no large concentration of energy is had in generating stations, system stability is a maximum and service is also a maximum owing to the simple layout and multiplicity of supply points. When several generating stations are used, there is no problem of tie cables or of load and wattless control. The system becomes the old Edison grid system, which has proved to be the most reliable system of supply and lacks only the storage battery to be comparable to the best direct-current supply system.

* * * *

New Jersey Public Service, Its Chief and Its Future

THE dinner celebrating the twenty-fifth anniversary of the Public Service Corporation of New Jersey was as much a tribute to its organizer and president, Thomas N. McCarter, as it was to the company. Few executives have been in harness as long or have contended with as many discouragements and disappointments. And yet obstacles apparently served to sharpen his aggressiveness and quicken his zeal; for out of it all Mr. McCarter rises triumphant, with a splendid vision for the future of his corporation and of his state that is almost dazzling in its scope.

Mr. McCarter was Attorney-General of New Jersey when he was chosen to form and head the Public Service Corporation. Eminent as a lawyer, he was nevertheless handicapped at first in a field which at the time was primarily engineering in character. That he developed with the business and adapted his viewpoint to the expanding activities of his organization meant much for the public and the industries of New Jersey. Nor was his enterprise overlooked; for New Jersey responded and co-operated, with the result that the Public Service Corporation has in recent years grown by leaps and bounds. To Mr. McCarter's leadership most of the credit for this is due, and in his present state of optimism and justifiable pride of accomplishment there is no task in aid of the further development of New Jersey to which the Public Service Corporation and Thomas N. McCarter in particular will not set heart and hand.



PRESTON S. ARKWRIGHT
President Georgia Power Company

Newly Elected President of the National Electric Light Association

Public Understanding the Keynote

Atlantic City convention notable success. Speakers dwell on social and economic aspects of utility service. Splendid business conditions reported. Exhibits attract thousands

MORE than eight thousand utility people and their friends met at Atlantic City on June 4 to 8 at the fifty-first convention of the National Electric Light Association. The meeting was another notable success in all respects—programs, exhibition, weather and attendance. It was a worthy addition to the great conventions held by the light and power industry in recent years, and the reports and addresses made at the meetings contributed greatly to its success.

Several major topics stood out as of primary interest at the meetings. The social and economic aspects of the utility business received great attention from the point of view of getting public understanding. The outstanding addresses of President H. T. Sands and other industry leaders were paired with notable addresses by leading bankers and industrialists. It was evident in these addresses that public understanding was a major problem to all business groups and that undivided executive attention was necessary to successful public relations.

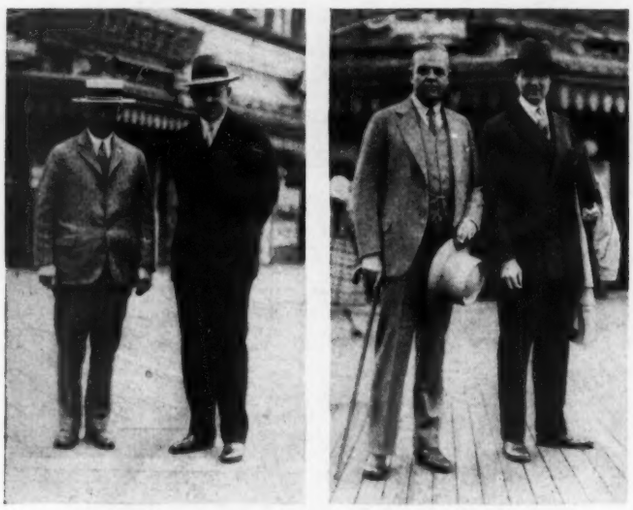
An epoch of selling has been reached by the light and power industry, and many notable addresses and committee reports attested the fact that the industry is going to do its selling job. The entire program covered regulation, railroad electrification, finance, commercial aspects of utility business, engineering, accounting, public policy, insurance, employee relations and a host of other topics which show the complexity, magnitude and national influence of the companies embraced in the association.

The first meeting of the convention gave evidence of the high quality of the programs that followed. After a hearty welcome to Atlantic City by a local official President Sands delivered his address. He said that the industry had made consistent progress during the past year on such projects as research, interconnection, home service, economy in operations and rural electrification and that nothing indicated that the peak of development had been reached in the art or in the service rendered. He praised the work of the four national sections as being basic to industry progress and told of the good work done by the committees of the association.

A notable feature of his address dealt with the Federal Trade Commission's investigation. In logical and sane terms he dealt with the several aspects of the investigation and recorded his confidence in the integrity of the utility industry and in the ethics of its leaders. He presented the facts in regard to school relations, public

utility information bureaus, financial expenditures and other matters which—by inference only in many cases—have been called propaganda activities. He asserted the need for public information and the obligation of the industry to furnish it. President Sands urged a sane perspective and expressed an unbounded faith in the industry, in its leaders and in the continuance of the public confidence it holds.

At this meeting Treasurer P. S. Young gave a report of N.E.L.A. finances and Chairman Howard K. Mohr reported good news concerning growth in membership in the association. Managing Director Paul S. Clapp, in an able address, recounted the developments in the industry, told of the work of the headquarters staff and gave a complete picture of the large number of activities in which the association is concerned. He asserted that the industry assumes responsibility for extending and improving electric service in America and at this time is making great progress in its efforts to bring electricity to the farms. He maintained that the size and prosperity of the industry made it a focal point of public opinion and that its work was the best evidence of the success with which it had carried out its responsibility for service.



J. S. Wise, Jr., G. M. Gadsby, L. O. Ripley and R. H. Timmons

In a ringing address J. F. Owens, chairman of the Public Relations National Section, dealt with the spiritual and service aspects of utility affairs. He declared that the signing of a contract was only half the service job and pointed out that all utility employees had an obligation to carry through to completion the broadest possible conception of service. He accented the need for telling the public about the utility business.

In an able paper A. W. Thompson, president of the United Gas Improvement Company, Philadelphia, presented the case of the investment company. He traced the economic growth of business, whereby it increased in complexity and size so that owner management was necessarily replaced by professional management and the pooling of finance and service resources. In his opinion the outstanding feature of the electrical industry was good management, and this intangible element had equal rank with the tangible assets of the industry. He then gave the well-understood basic values accruing to the use of holding-company operations in the utility business.

Radio and its importance as a load and as an operating facility was the topic of an able paper by H. P. Davis, chairman of board, National Broadcasting Company. He said that the advent of the alternating-current radio set makes possible a new and attractive load for utility lines and that radio broadcasting opened new approaches for utility executives to get public understanding.

A feature of this meeting was an announcement by R. F. Pack that a co-operative research project had been approved whereby $300,000 per year for ten years would be spent under N.E.L.A. auspices.

As Others See Us

Addresses by Samuel M. Vauclain, president Baldwin Locomotive Works; Oswald W. Knauth, vice-president R. H. Macy & Company, and Henry G. Wells, president National Association of Railroad and Utilities Commissioners, were features of the Wednesday morning general session. From within the industry there were addresses by J. E. Davidson, chairman of the Commercial National Section, and Dr. Willis R. Whitney, General Electric Company, the first being a vigorous call to sales action and the second a general picture of how closely progress is tied up with scientific research. The rate research report by Edwin Gruhl had even more interest than in previous years because of its analysis of recent criticisms. Reports of the codes and standards committee by I. W. Day and the exhibition committee by E. W. Goldschmidt completed the program.

Mr. Vauclain, relating some history on which future prosperity will have to be built, announced that as far back as 1890 he specified individual electric drive throughout the Baldwin works. Despite this pioneering move, industry as a whole was only 4 per cent electrified ten years later. "Why do industrial plants continue to put in their own boilers and generating equipment when the total costs of power so developed will be from three to six times that of purchased power?" he asked. Mr. Vauclain expressed the opinion that it is folly to worry about displacement of common labor with machinery because we shall not have any common laborers, in the old sense, soon. He urged industries to listen to the suggestions of their younger men, convinced that their power of understanding is greater than that of the passing generation on account of increased facilities for education. The prophecy was made that all trunk-line railroads and 50-mile laterals on the Atlantic Coast from Boston to Washington will be electrified in the next ten years.

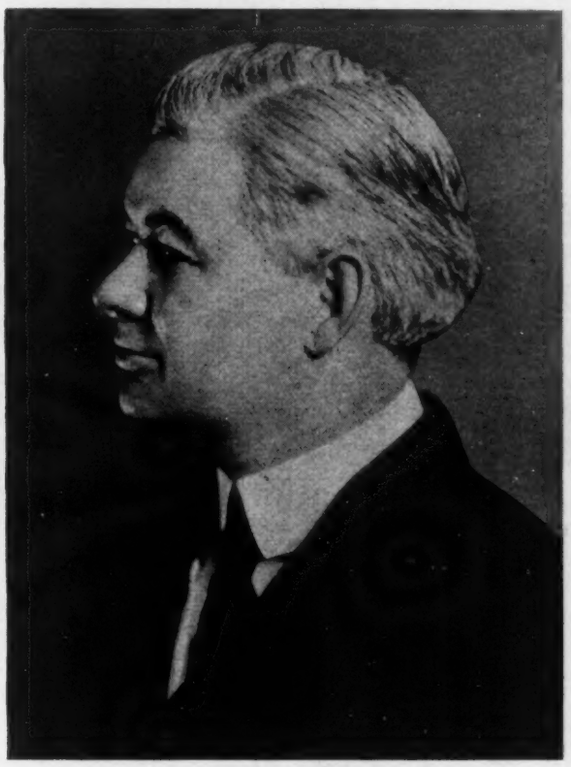
Mr. Knauth outlined several principles of good merchandising. These are affording varied but rapid selection, permitting returns within a reasonable period to maintain good will, adjusting sales force to periodic fluctuations in volume, and balancing turnover and selection. Difficulties imposed by utility merchandising methods were related. He expressed the opinion that utilities should leave merchandising to existing distribution channels and concentrate on expanding public consciouness of opportunities for using electric service.

Mr. Wells defended utilities against certain accusations but at the same time warned of impending trouble if certain practices are not avoided. For example, he said that the majority of the industry should exercise moral suasion on the minority to prevent bad practices. Utilities must assume the duties imposed by their privileges. Electric utilities have the right to be heard in newspapers, public schools and in Washington, he declared, the same as any industry when it is oppressed or

misunderstood, but there must be no evasion or distortion of truth. Holding companies are justified, he declared, until they become mere stock-jobbing concerns that ignore the rights of subsidiaries and conceal profits. Considerable attention was given to what constitutes a fair basis for figuring returns and avoidance of delays in adjustments.

Mr. Gruhl contended that many criticisms of rates are so general or are based on such non-comparable circumstances that they cannot be answered. Furthermore, a failure to refute last year's analysis of rates implied ignorance or misrepresentation on the part of critics. He reported that analyses of the two recent criticisms of rates including "What Price Rates?" have been completed. Since 1926 there has been a reduction of nearly 3 per cent in the average domestic rates.

J. F. Owens



A. W. Thompson

Newly elected vice-presidents of the National Electric Light Association

Railroad Electrification Featured

On Wednesday afternoon a splendid program was presented which featured railroad electrification as one of the outstanding possibilities for further business growth. Britton I. Budd presented a report of the railroad electrification committee which contained complete statistical summary and digest of opinion as regards electrification in all parts of the world. Recent developments in this country pointed to a rapid increase in railway electrifications supplied from utility lines. President Lawrence A. Downs of the Illinois Central gave an excellent paper on this topic. He told of the reasons for and results of the Chicago electrification and predicted a big future for electrical operation. He urged greater standardization as a means to increase the growth and reduce costs.

John E. Edgerton, president of the National Association of Manufacturers, gave a fine talk on the relation of government and business. Politics, feeding on public indifference, was alleged to be largely responsible for bad trends in the relation of government to business, and he argued that no help could be had until this indifference had been dissipated. He observed that government had got into industry and business largely by invitation and that government takes advantage of industry group selfishness and quarreling.

Women are inquiring into government and into social and economic affairs, Miss Belle Sherwin, president of the National League of Women Voters, declared in a good address which outlined the methods used by the league to develop women's thoughts and acts on aspects of business.

A feature of the meeting was the notable progress recorded in rural electrification during the year and an address by Clifford V. Gregory of the *Prairie Farmer* which discussed rural electrification from the farmer's point of view. He said that farmers were machinery-minded and desired electric service, and he outlined a method which he thought the best for doing work for rural electrification.

Public Policy Meeting

On Wednesday evening the feature meeting of the convention was held. A large audience listened to masterly addresses by R. H. Ballard and Melvin A. Traylor, president First National Bank of Chicago; witnessed the Coffin award presentation to the Puget Sound Power & Light Company and was entertained by Richard Crooks, tenor, and B. A. Rolfe's orchestra.

R. H. Ballard, chairman of the public policy committee, gave an able address on public policy and presented the official statement of the National Electric Light Association about alleged propaganda and undue influence on schools and concerning other matters of public interest.

Mr. Ballard said the greater use of appliances in homes and increased efficiency in operation had made it possible for the industry to reduce rates to customers and yet improve service. He dealt at length with the Federal Trade Commission's investigation and showed how the utility industry had followed economic trends of today to better and cheaper service and had used every logical method to tell the public about its business. The industry rightly has taken steps to defend itself against attacks of a group whose every act indicates a lack of practical knowledge in business affairs and whose guiding thought is political rather than economic. Certain proposed governmental projects involving the power business and built upon unsound economic ideas were also combated by the men who had made a specialty of public service. The record of the industry in service and achievements was held out as proof of ability. Mr. Ballard said that a duty rested upon the industry to make its affairs known to the

S. Z. Mitchell, B. I. Budd and F. L. Dame

people and to advise them about matters of industry concern.

The social and economic aspects of the utility industry were dwelt upon by Mr. Traylor, who made a summary of economic evolution in business, stated the needs of modern business and dealt with the social relations and obligations involved in the conduct of big affairs.

Education and Water Power

On Thursday morning several papers dealing with education were presented. Dean C. O. Ruggles of the College of Commerce, Ohio State University, gave an outline of a survey under way to evaluate industry needs in man power and the ability of the schools to impart the necessary instruction. Deane W. Malott, assistant dean Harvard Graduate School of Business Administration, said business had become a professional occupation and that the professional business schools were needed. He said these schools must work closely and intimately with industry to get the best results.

At this meeting Paul A. Schoellkopf presented an excellent report on water-power development which was replete with statistical data and contained an admirable summary of industry ideas on this subject. Franklin T. Griffith strikingly discussed private business and government business relations and stressed the imperative need of private initiative and research in the utility business if advances in service are to be recorded.

It was taken for granted that the lamp committee report presented by Chairman Frank W. Smith would be another notable addition to the fine reports this committee has prepared in the past. The data on lamp production, lamp voltages and lamp sales and a discussion of the business aspects of the subject gave an encouraging aspect to the lamp situation. At this meeting also W. H. Onken, Jr., gave the N.E.L.A. prize awards committee report. The prize winners are recorded elsewhere in the issue. Mr. Onken reported that an unusually good list of papers had been submitted.

Teamwork and Co-operation

On Thursday afternoon reports and addresses of much merit were presented. Fred R. Jenkins told of the notable accomplishments of the educational work with employees. W. W. Freeman gave an address devoted to the value of teamwork in utility progress. He pointed out the interrelations in the utility business, the possibilities for more and better service, the dependence of the utility industry upon other industries for prosperity, and gave in all a striking picture of what teamwork would accomplish.

Breadth of vision and a tangible conception of the need for and value of well-developed commerical aviation facilities characterized an able address by William P. MacCracken, Jr., Assistant Secretary of Commerce, Washington, on commercial aëronautics. Progress in this direction has been rapid in this country, but business in general has not supported commercial aëronautics sufficiently or realized the service it can render, he said. A development program should receive the hearty support of all business.

Labor's part in electrical development was the topic of an address by Hugh Frayne of the American Federation of Labor. American labor has done wonders to enhance its status through its own efforts and through its foresight in adapting its program to the evolutionary advances in modern science and industry, Mr. Frayne asserted. As never before, labor is using its head as well as its hands, and it seeks to use power, mechanical production methods and other developments so that economic benefits both to the country and for labor will result.

In a fine address Merle Thorpe, editor of the *Nation's Business,* dwelt on human and governmental relations in business. Paternalism is the American brand of socialism and is the real foe of our democratic institutions today, he declared. Paternalism breeds bureaucracy, and bureaucracy is a greater menace today than communism or autocracy. Paternalism now looks for new worlds to invade and has assumed two phases—alleged governmental service and government operation of business. The spearhead is leveled at the public utilities. Paternalism would produce and distribute power and light. It would manufacture and sell fertilizer. It would market the farmer's grain and hogs. It would operate the merchant marine. The electrical industry is today carrying its brunt of the attack. If the bureaucrats are successful, they will then turn their attention to the canners and bankers and steelmakers. The present attack on the utilities is a signpost marked "detour." It would take us down an uncharted road with uncertain destination, harassed by bureaucracy, denying us a continued higher standard of living and our destiny of economic freedom.

A thoughtful address on the evolution of business was delivered by John T. Madden, dean of the School of Commerce, New York University. He traced the growth toward consolidation and pointed out the economic pressures that have resulted in the use of investment compa-

nies as a means to conduct big business under present conditions.

The final meeting on Friday morning was marked by two addresses of much interest. Interconnection freed from "bunk" was the topic of George N. Tidd, president American Gas & Electric Company. He deplored much of the publicity given the non-essentials of interconnection and pointed to the need for telling the public in tangible terms how interconnection benefits service.

The other address was by James H. McGraw, president McGraw-Hill Publishing Company, Inc. Mr. McGraw discussed industry selling and stated that the major principles which should be applied were the quality of the product, its presentation and its price. In the modern business world, he said, competition between industry groups made it necessary to study selling problems as never before, and he urged the electric industry to take its proper position in the marketplace.

Constructive talks by Arthur Williams, chairman of the insurance committee, and John F. Gilchrist, who gave a very helpful address on electrical advertising, were added features of the final session.

Four Sections Active

On Tuesday afternoon the four national sections held their meetings, and each attracted a large and interested audience. The committee reports were all records of industry stability and progress, and addresses of high merit added to the value of the meetings.

At the Public Relations Section meeting Chairman J. F. Owens urged the necessity for all utility people to help in getting the public to understand the utility business. That his admonition is being put into tangible form was attested by the splendid series of reports presented at the meeting. Feature addresses were those of Clayton Rand, president Dixie Press, Gulfport, Miss., entitled "Thunder and Lighting," and Mrs. Anne Steese Richardson, *Woman's Home Companion,* entitled "Women's Place is in the Home." Both speakers dwelt on human values and with wisdom and humor gave inspiring suggestions which could be applied to public relations work.

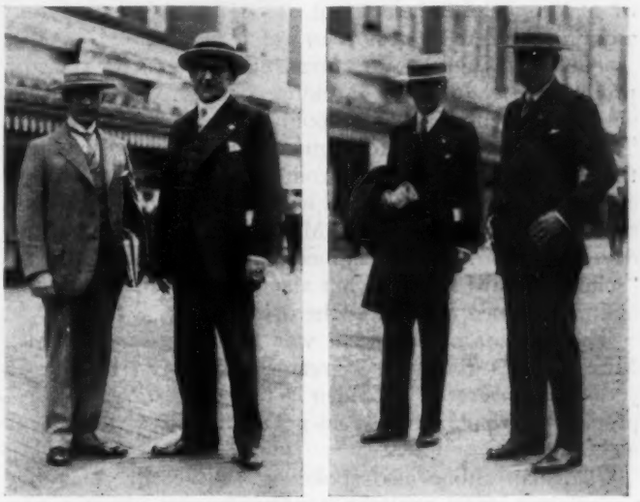
Accountants Aid Management

To any one whose last glimpse of an N.E.L.A. Accounting Section meeting was ten to fifteen years ago the attendance at this year's session was a great surprise. The "Rose Room" of the Traymore, in which seats for approximately 300 were provided, was completely filled. Long technical committee reports have been discontinued, as in the other sections, by presenting serial reports throughout the year, and there is a trend toward bringing in viewpoints of other than utility accountants. One paper was presented by Charles B. Scott, president Bureau of Safety, Chicago, on "Insurance Costs." He emphasized the possibilities of economy by comparing losses and premiums, making structural changes and analyzing personnel according to risks. His paper is abstracted elsewhere in this issue.

An inspirational address was delivered by Earle W. Hodges of Henry L. Doherty & Company on "Common Sense and Dollars." A discussion on "Accounting Treatment of Securities Discount and Expense" was given by Prof. David Himmelblau of Northwestern University, and in it some rather unorthodox suggestions were made.

E. W. Lloyd, vice-president Commonwealth Edison Company, emphasized an outstanding problem for which accountants must find the solution if utilities are to continue stimulation of energy usage through merchandising and new-business activities and not be penalized for expenses which are not truly merchandising or commercial. He referred particularly to the disposition of expenses for promoting pioneer uses of electricity, such as electric heat applications and devices which have not received general public acceptance. Allocations of expenses for transportation, rent, advertising, servicing, etc., connected with merchandising and new business are also not equitable, he declared. His contention was that some expenses are not truly merchandising expenses and should be chargeable to electricity sales. A more complete report of his address is presented elsewhere.

E. A. Davis, Accounting Section chairman, in opening the session, pointed out that growth of business and government requirements have imposed a burden on accounting departments that has not been relieved by increased



W. H. Onken, Jr., R. H. Ballard, Marshall Sampsell and M. J. Insull

personnel. He urged greater dispatch in organizing committee activities each year, avoidance of let-up in activities around March, and organization and training of accounting personnel for promotion through succession.

H. C. Hasbrouck pointed out that the N.E.L.A. classification of accounts has been adopted by 29 state commissions and is favored by four more. For next year he recommended co-operation with the Commercial Section on merchandise and jobbing accounts and standardization of interconnection agreements. B. F. McGuire reported great development in machine accounting that has simplified operations and reduced unit costs. J. E. Loiseau announced that two reports on corporate finance—investment surplus and mortgage provisions—had been submitted and reported that work had been started on the latest tendencies.

M. R. Scharff declared that excellent results on studies of fixed-capital accounting had been obtained by assigning different phases to geographic divisions and recommended studies of additions to leased companies, periodic audits, improvement budgets and joint-pole construction. E. J. Brett recommended discontinuance of the general records committee. W. G. Young referred to three serial reports on purchasing and storeroom accounts. R. G. Smith announced that the summary of 1927 statistics from more than 300 utilities are now available.

The engineers of the industry at their meeting dealt with the economic aspects of the utility business. They presented a planned program for research, for system building, for standardization and for expenditures whereby their new slogan of "More capacity per dollar of investment" would have a tangible result.

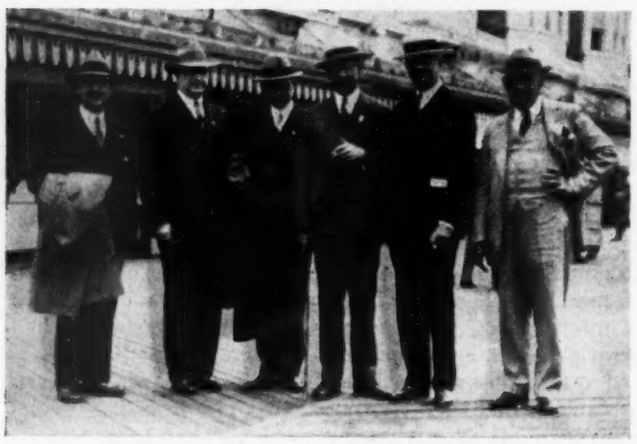
The work of the year was outlined briefly by E. C. Stone, chairman of the National Section, and the attendants then listened to three able addresses. Alex D. Bailey stressed the importance of engineering research in utility progress. He noted the research work done in this country by several organizations and in conclusion stressed the point that the N.E.L.A. itself should embark upon a research program if it hoped to achieve the best results quickly.

W. E. Mitchell, vice-president Georgia Power Company, addressed the Engineering Section session on Tuesday afternoon. His subject was "Spending Our Company's Money," but Mr. Mitchell confessed to the "hobby of making human beings out of engineers," stating that any one could tell you how to spend money.

The opportunities for advancement and the type of progressive engineering thinking conducive to successful activities in this field were pointed out by Mr. Mitchell. The problems of a broad engineering viewpoint involving the increase of industrial productivity through scientific developments and a sense of engineering costs were considered as essentials. Mr. Mitchell urged not only the development of young engineers for utility work in the "school of hard knocks," but also the development of the abilities of men already in the organization.

The field of management was that suggested by Mr. Mitchell as offering the greatest promise. He urged young engineers to "broaden your field, lift your eyes, prepare for opportunities, eat up all the responsibilities in sight."

Chairman Stone also spoke on engineering planning and dealt at length with the complete meaning of economy

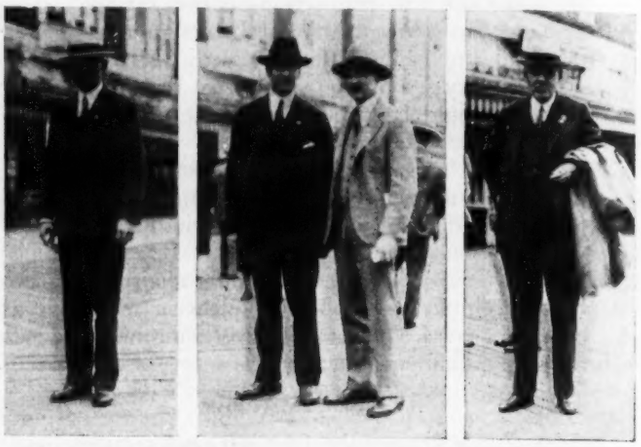


A group of electrical men, including P. S. Arkwright, W. A. Taylor and H. P. Liversidge

in system planning. The engineer has a responsibility second to none in the industry, he said, and must measure up to the new economic conditions faced by it.

The Commercial Section closed its year's work with the announcement of many fine achievements. Outstanding was the final approval by the public policy committee of the interstate agreement on appliance merchandising. This has been a splendid achievement by the merchandising committee under the leadership of E. R. Greenwood, resulting in the adoption of certain merchandising principles by the power industry and the various associations of retail dealers who sell electrical household appliances. The merchandising committee also announced that 159 central station companies have entered the one-more-kilowatt-hour-per-day contest.

S. N. Holliday of the General Outdoor Advertising



J. F. Owens, W. E. Mitchell, A. M. Perry and President H. T. Sands

Company pictured the waiting opportunity for the upbuilding of the sign load and declared a potential business of $200,000,000 a year in prospect. M. C. Huse reported for the wiring committee, outlining the plans for co-ordination with the coming program of the Industry Sales Conference and commenting on the state of code development. H. W. Derry presented the report of the power committee in the form of a chart talk picturing the field for further development of motor load. W. H. Sammis exhibited two reels of a moving picture of electric heat in industry.

Starting with the reception to President and Mrs. Sands on Monday night and reaching a climax at the ball on Wednesday night, the social and entertainment features of the convention maintained the high standards of previous years. The ladies came to the meeting in large numbers, and dances, teas, trips, golfing and other pursuits afforded pleasure in ample amount. Dancing on the pier was the evening attraction of greatest drawing power.

Exhibits Better Than Ever

Serious interest in the exhibits well repaid the manufacturers in presenting a splendid display of new appliances and apparatus. That progress in the industry still goes on apace became self-evident after viewing the material on display. Despite the mechanical nature of the equipment, year after year the show is being made more beautiful and artistic in appearance.

Manufacturers who exhibited did not show a mass of equipment but confined their display to new developments. There were 209 companies participating. This means that 53 per cent of the manufacturer members took part, and, because of the lack of available display space, a few were unable to obtain booths. There was a 7 per cent increase in exhibits, since in 1927 194 manufacturers took part. From 41 participating companies in 1908 to 209 in 1928 is the colossal achievement in a display which now includes the most modern electrical appliances and power-house and distribution equipment.

President Sands' Address

Work of the year discussed
Discussion of Federal Trade Commission investigation
Comments on committee activities

THE past year has witnessed a continuation of that consistent progress which has been the record of our industry from its inception. Intensive research conducted by our engineers is continually bringing to light new methods and economies in the production and use of electrical energy. Turbines with capacities and efficiencies hitherto unknown have been displaced by those of still greater capacity and efficiency.

High-voltage transmission and interconnection have gone on apace, bringing to the smaller communities electric service of the same character furnished to the large cities. There is a distinct trend toward decentralization of industry, due to the ability of smaller communities to offer to industry dependable electric service at reasonab'e cost. The home has been made a much more livable institution and the burden of the housewife greatly lightened through the introduction of the many domestic appliances which have demonstrated their worth. During the year 1927 one and one-quarter million homes were furnished with electric service for the first time.

H. T. Sands

Electric service on the farm has become a practical reality. Some four hundred thousand farms are now receiving electric light and power company service, and the farmer and his family are enjoying a standard of living and comfort hitherto unknown through the many profitable applications of electricity to farm homes and farm work. Mass production has reduced the cost of generation and the public has received benefits therefrom. Today electric service is being furnished over wider areas and at a lower cost per unit to the consumer than ever before.

Our service touches intimately the industrial and social life of the entire country and affects both the comfort and the economic welfare of every individual in the nation. This imposes on the industry an obligation of service of which it is keenly conscious and which it is anxious to discharge to the utmost of its ability. What the future may bring no one can foretell; but the record of the past justifies the belief that in the development of the art we have by no means reached the peak—that new inventions and discoveries will make possible a still more extended use of electric service and at a lowered cost to the consumer. As in the past, each step in future development will bring with it its own peculiar problems. The industry faces the future confident of its ability to solve these problems as they arise in the interests of all concerned and to continue to render to the public a good account of its stewardship.

As in past years, the major portion of the activities of the association during the present administrative year have been conducted through the several committees of the four national sections — Accounting, Commercial, Engineering and Public Relations. The interim reports published during the year and those to be presented to the convention by the chairmen of these four national sections present a fairly complete picture of the year's accomplishments. It is my purpose, therefore, to consider only some of the outstanding activities undertaken by these national sections, to touch briefly on some phases of the work of some of the other national committees and make some observations in respect of some present-day matters that I deem should receive the careful consideration of the members of the association.

Accounting National Section

IN CARRYING on the work of its several committees, the Accounting National Section has placed added emphasis on the importance of geographic committee organization, co-ordinated with the committee organization of the national section. Much attention has been given to the public relations aspect of the work of the accountants in our industry and to the importance of the accountant viewing the conduct of his departmental activities in the light of its effect not only on the accuracy of the companies' records but also on the companies' relations with the public.

The section has also had clearly in mind the desirability of the trained accountant executive, believing that more and more the industry will require executives with a thorough groundwork of accounting experience.

This objective brings to the work of the several committees a wider perspective and to the accountants in our industry a broader outlook. The accounting department is the compass by which the managing executive establishes his position and determines the future course to be followed.

Commercial National Section

AT THE request of the executive committee of the Commercial National Section, and with the approval of the national executive committee and the public policy committee, a commercial director has been engaged and is now attached to the headquarters staff. The association is particularly fortunate in having secured for this position C. E. Greenwood, for many years in charge of the commercial department of the Edison Electric Illuminating Company of Boston. Mr. Greenwood brings to this office a long experience in the commercial activities of the association and is particularly qualified to fill this most important position.

Another new activity undertaken under the auspices of this section resulted in the establishment of a service in home economics available to colleges and teachers. Miss Eloise Davison, professor of home economics in Iowa State College, has been engaged for this work. Her services are available to colleges and universities throughout the country. The requests already made upon the association for these services demonstrate the worth of this new activity.

In building for better and more aggressive merchandising practices, the section has stressed the importance of having high-grade executives at the head of the commercial departments of the operating companies—executives who will measure up to the sales executive in other lines of business.

Under the auspices of the merchandising committee several meetings have been held with representatives of other lines of business engaged in the sale of electrical appliances. Out of these conferences has come a realization of mutual interest and a better understanding of one another's problems. A set of merchandising principles has been drawn up and subscribed to by the various interests represented in these conferences.

Engineering National Section

THE Engineering National Section adopted as one of its major aims in this year's work "more system capacity per dollar of investment." To this end the section has effectively co-operated with manufacturers of apparatus and equipment for more extensive standardization. Much work has been done and excellent results have been accomplished in co-ordinating the research work carried on by the several branches of the electrical industry.

The accident prevention committee, in collaboration with committees of the American Gas Association, American National Red Cross, American Telephone & Telegraph Company, Bethlehem Steel Corporation, United States Army and Navy, United States Bureau of Mines, United States Bureau of Standards and United States Public Health Service, has prepared and published a "Manual for First Aid and Resuscitation" for use by employees in case of electric shock, asphyxiation or drowning. This manual should be in the hands of every employee.

I wish to speak in particular of the excellent and constructive work which continues to be done by the inductive co-ordination committee. I question if the importance of this work is fully appreciated. In spite of the increased inductive influence from new high-voltage construction and larger loads on distribution feeders and the increased sensitivity of communication circuits, expansion in facilities has taken place with a minimum of conflict with those in charge of communication interests.

This development has taken place on the basis of engineering treatment, without the enormous burden of expense that might have been entailed in legal disputes. It represents a co-operative effort in American business of the highest order.

Public Relations National Section

PURSUANT to resolution adopted by the executive committee of the Public Relations Section of the preceding year, the section has undertaken a survey of public utility education in the colleges and universities. The object of this survey is to determine:

1. The extent to which there is a study of public utilities in college and university courses.
2. The character and extent of the industry's demand for college-trained personnel.
3. The character of the opportunities open to college-trained personnel in the industry.
4. The willingness and ability of the industry to co-operate with colleges and universities.

For this most important work the association secured a man eminently qualified by training and experience to conduct the survey, Professor C. O. Ruggles, dean of the College of Commerce and Administration of Ohio State University, who was granted a year's leave of absence to undertake this survey. The details of the survey will be presented to you by Dean Ruggles at one of the sessions of this convention. Let me say, however, that in my judgment this is one of the most important activities ever undertaken by this association, and in its conduct we have had the most hearty, wholesouled co-operation from the colleges and universities of this country.

The need of continuous public information as to the fundamentals of our industry is becoming increasingly apparent. There is no better medium for presenting this information to the public than the local newspaper, interested as it is in the local community and all that pertains to its advancement. With this thought in mind there was prepared under the direction of this section an advertising copy service which has furnished to the member companies suggested copy for publicity matter to be published in the local newspapers. That this service has been worth while is evidenced by the extent of its use and commendations of the character of the copy.

Committee on Civic Development

THE prosperity of any community and of the electric light and power company serving it go hand in hand. There is a mutual dependence which this industry clearly recognizes. Community growth and development is dependent upon the ability of its utilities to keep abreast of community expansion, and, conversely, the growth of any utility is measured by the development of the community it serves. Realizing this mutual interest, there was organized a new committee, the civic development committee. Its purpose is to interest our member companies in co-operating with every interest working for community development. Of necessity the

work this year has been largely that of organization and survey.

In co-operation with the Metropolitan Life Insurance Company a conference on the migration of industry was held which was largely attended by business executives from every section of the country. We believe the work of this committee will be one of major importance to the country and to the industry.

Insurance Committee

PRIOR to the present administrative year the insurance committee had concerned itself largely with the question of rates for various classes of insurance carried by our member companies. This committee by presenting to insurance companies an accurate summary of insurance experiences has obtained substantial reductions in rates for fire and casualty insurance. The committee is to be commended for its efforts and accomplishments. In these accomplishments your insurance committee and the representatives of the insurance companies have worked harmoniously.

There are, however, other points of mutual interest. Both interests are concerned with the formulation of all rules and requirements pertaining to the installation of electric wiring and equipment. The insurance companies of this country are large investors in the securities of this industry, and there often arise questions involving matters of policy. In view of these mutual interests the scope of the insurance committee has been broadened and its personnel has been enlarged to include not only insurance technicians but executives who can meet with the executives of the insurance companies to discuss matters of policy whenever occasion requires. Arthur Williams, past-president of the association, has undertaken the important work of chairman of this committee.

Geographic Divisions

YOUR president has attended the conventions of every geographic division, with the exception of the Canadian Division. It is a great pleasure to be able to report to you that the work undertaken a few years ago of organizing the geographic divisions is bearing fruit and that these divisions are now functioning effectively and rendering a valuable service to their member companies.

The several committees of these geographic divisions are, in so far as local conditions warrant, co-ordinating their work with that of the similar committees of the national association. These committees have a comprehensive grasp of the character of the work to be done and of the methods to be adopted in its accomplishment.

Rural Service Committee

THE rural service committee has directed its activities toward assembling, digesting and publishing the results of the experiments which have been carried on for several years through the farm experimental lines established in various sections of the country. Out of the work of this committee has come a growing appreciation on the part of the farmer of the desire of our industry to co-operate with him in solving this very real problem of farm electrification and a better understanding of what is involved in the extension of electricity to the farm.

The work of this committee has developed slowly but surely. We have endeavored to make certain in what way electric service can be used with profit to the farmer and to avoid saddling upon the farmer electric equipment poorly adapted to his needs. This means time, but it will, I believe, prove to be time well spent.

In co-operation with the local utility, arrangements have been completed for the establishment in the State of Maryland of a permanent national exhibit of farm electrification. This exhibit will display every known adaptation of electricity to farm work and, being situated near the nation's capital, which is visited yearly by thousands of people from all sections of the country, will, we hope, prove a national attraction.

Exhibition Committee

THE work of the exhibition committee speaks for itself. A visit to the splendid exhibit on the pier adjoining this auditorium is a most liberal education to all concerned in the electrical industry. No one can afford to leave this convention without a thorough inspection of this exhibit. The association wishes to express its appreciation of the splendid co-operation of this committee in carrying out the many difficult details connected with this exhibit.

Society for Electrical Development

DURING the year the Society for Electrical Development has been completely reorganized, and it now constitutes an effective medium for carrying out the work which its name implies, electrical development. As now organized, the four major branches of the industry—the manufacturer, jobber, contractor-dealer and the electric light and power companies—all have equal representation on its board of directors. Under the auspices of the society an industry sales conference has been organized and is now engaged in the preparation of a plan for intensive development of residential business.

Your association has whole-heartedly co-operated in this reorganization. W. W. Freeman, president of the society, is to tell the convention of the society's work and plans.

Federal Trade Investigation

ONE of the outstanding events of this year has been, and still is, the investigation being conducted by the Federal Trade Commission. Before it commenced spokesmen for the industry said over and over again that there was nothing to fear from an honest inquiry and that there could be no objection to it. That still remains our attitude. We want it to be most searching and complete. We are anxious that the true facts be given to the public, that the people of the country may see and understand the make-up and habits of the organizations that furnish them the light for their homes and the power for their factories.

The National Electric Light Association, the Joint Committee of National Utility Associations and every organization representing the utilities, whether national or local, have thrown open to the commission everything in their possession. Minute books, account books, receipts and expenditures, vouchers, correspondence—in fact, every scrap of paper—have been made available for scrutiny. Every publication issued, every address delivered, every news release made, has been made available for examination by commission representatives. More than 2,500 separate exhibits have already been

introduced and made part of the record, and accumulation still goes on.

It is easy to get a false impression of the investigation and of the manner in which it is being conducted. As we read daily in certain newspapers distorted versions with startling headlines and see prominently displayed photographs of letters and checks, we get an idea of sensationalism and perhaps visualize the hearings as exciting scenes. In fact, they are nothing of the kind. They are conducted quietly and peaceably. The atmosphere is that of a court room and the proceedings consist largely of the routine identification and orderly introduction of documents. That is the way in which the record is being made upon which the commission will finally base its findings and recommendations. The record gives the true story of what happens and it can be found nowhere else. That story is quite different from the narratives with which we are daily regaled in some of the daily newspapers.

The School-Book Situation

Let us consider, for instance, the school-book situation. Under the direction of the state committees of public utility information, pamphlets dealing with electric light and power, gas, telephones and street railways have been published and furnished for use in the public schools. From some of the newspaper accounts, one would think that the utilities, in some mysterious manner, have forced innocent school officials to compel their students to learn falsehoods from textbooks composed of propaganda, or else that there has been a conspiracy between utility companies and school teachers to pervert the youthful mind.

It is an insult to American intelligence to believe that the utility companies would ever undertake such a plan, or that the thousands of earnest, hard-working school teachers throughout the land would allow it to be carried out if attempted. The men and women who teach the youth of our country must resent this imputation on their intelligence and their integrity. The American people will not believe that they are either fools or scoundrels. I do not speak on their behalf, but as to the utilities, I say that if they had ever undertaken any scheme to corrupt instruction, the individuals who were guilty of it could not be too strongly condemned and would already find themselves beyond the pale of good utility society. Of course, the answer is that no such thing has ever happened, or could conceivably happen. The very record before the Federal Trade Commission shows that it did not.

It is true that the utilities have furnished material for the use of teachers in the schools. They have done so openly, frankly asserting authorship and gladly assuming responsibility. No teacher has ever received copies for such use unless, after reading a sample, he or his school superiors have decided that it was useful to him and his students and asked that it be furnished. For several years the utilities have been giving this assistance to teachers. It is a public service known to everybody with school connections. It has been welcomed and appreciated, as thousands of letters of thanks testify. It remains for a certain type of press to discover and declare an evil in it.

What is the material that has caused all this disturbance? Is it a discussion of the theories of government, of private against government or municipal operation, or of any other controversial subject? Not at all. It tells about inventions, and turbines, and transformers, and transmission lines and ohms and amperes and kilowatts and the other things that go to make modern electric service possible. If I were stirred to any emotion at all by such matter, I might sympathize with the school child who has to put in his time studying it; but I would not worry about the effect on his political or economic opinions.

The pamphlets are almost pure statements of undisputed facts. It was intended that they should be so. As stated by one of our able executives, in testifying before the commission on this subject, the school pamphlets "are as strictly informative as it is possible to make them with the intelligence that God gives." That was the purpose. That was the way they were written and the way they still appear as introduced by the commission itself in the record.

Perhaps the best proof of the excellent character of these pamphlets, of their unbiased presentation of the subjects, is the fact that adverse critics have been able to discover practically nothing with which to find fault. Out of the scores of pamphlets introduced in evidence, only one paragraph from one copy from one state, not found in any of the others, has been held up to public gaze as an improper statement.

It is important, as these hearings proceed from day to day, that we keep a proper sense of perspective. Let us not magnify a detail until it absorbs the foreground. It is the completed portrait that will count.

Human Frailty Exists

Human frailty exists in our industry as in all others. In an investigation like this, involving every act during the life of thousands of companies, hundreds of thousands of separate transactions, sales and purchases of properties, and manifold issues of stocks and bonds—business arrangements carried on by a multitude of individuals for the last quarter century—it would be miraculous if there should not be found some instances of bad judgment, of the influence of greed, even perhaps of actual wrongdoing. Such instances, if any be found, will, I am certain, represent a very minute percentage of the transactions under investigation.

None of us has yet attained perfection, and, besides, a transaction scrutinized with the hindsight of today may have quite a different aspect from that which appears when viewed in the light of the facts and circumstances surrounding its origin. Each association, each company, each individual must take responsibility for its or his own acts, receiving the credit or the blame that the record brings. Every tub must stand on its own bottom. Blame, if cause be found for any, should be placed where it belongs. The entire industry should not be condemned because of the misdeeds of a few, if any. The public utilities today are in the vanguard of American business. They are proud of accomplishments of the past; they do not fear the proceedings of the present; they are confidently carrying on their plans for the future.

Of late there has been some public criticism of the activities of the association. Such criticism discloses a gross lack of understanding of the character of the activities criticised. In the past few weeks certain portions of the public press have carried statements to the effect that the annual budget of the association, amounting to approximately $1,444,000, has been expended wholly for the purposes of propaganda and that this expenditure constitutes a burden on the consumer of electric service which he should not be asked to bear. There is nothing in the record or in the facts to bear

out this statement. Such a statement completely ignores the many other activities of the association, all of which are maintained in the interest of good public service and, because of the co-operative character of your association, are carried on at a most reasonable cost to the industry.

The total annual cost of carrying on all of the activities of the association, including the refunds to the geographic divisions, amounts to approximately sixteen one-thousandths of a mill per kilowatt-hour sold to the public, or between four and five cents per customer per year. The amount which the association expends annually for the work of public information, which has been termed "propaganda," does not exceed $50,000—less than one-third the amount we are expending alone in the furthering of the extension of electric service to the farms of this country. The so-called "burden" laid upon the consumer annually can be reckoned only in fractions of a cent.

In particular, criticism has been directed to our work with educational institutions. In some instances it has been charged, referring to our co-operation with colleges and universities, that we are endeavoring to subsidize these institutions and use them as mouthpieces for the industry. Nothing could be further from the truth than this charge. We have been co-operating with educational institutions. We are now co-operating with them, and I hope shall continue to do so so long as these institutions desire our co-operation.

The purpose of this co-operation is to ascertain the material needed by these institutions to enable them to conduct their courses in public utilities on the bases of fact as applied to present-day practice and, once we have ascertained the material needed, to render such assistance as we may be able in placing such material in their hands, to be used, however, at their discretion. In no instance has the association endeavored in the slightest degree to coerce, to subsidize or to direct in any way the conduct of these institutions.

The time has long since passed when the purpose of a collegiate education was to fit men and women for the so-called professional careers alone. Today business is regarded as one of the greatest and most important of the professions, and out of the conduct of business as constituted today has come a new profession, the profession of management. It is of the utmost importance to every interest in this nation that our young men and women leaving our colleges to enter the field of public utility business shall be thoroughly grounded in the economics of that business.

No industry has a greater concern than ours in the integrity of our educational institutions. The charge is laid at our door that we are "propagandists," the purpose of this charge being evidently to discredit the work of public information. In so far as a propagandist is one who disseminates information based on fact, we plead guilty with pride. No matter how severe or how bitter the criticism, we must not relax our efforts to acquaint the public with every phase of our industry. We cannot do otherwise if we are to keep faith with the public and adequately discharge our service obligation.

I have an abiding faith in the integrity and the ability of the American public to deal fairly with our industry once it is possessed of the requisite information for the exercise of intelligent action and the formulation of sound judgment. If we, because of adverse criticism, indifference, or for any reason whatsoever, fail to see to it that the public has such information, then we must not blame the public if at times it fails to accord to us that measure of justice to which we feel we are entitled.

This industry is justly proud of its record. The high standard of living which has been attained in this country, higher than that enjoyed in any other country, would have been impossible without electric service. The men and women engaged in the industry are deeply conscious of their duty as public servants and are earnestly and conscientiously striving to discharge that duty. They are proud of its accomplishments, but their pride is measured not in dollars gained but in service rendered.

Suggested MERCHANDISING STANDARDS*

1. The general sale of electric devices at margins commensurate with the cost of selling is the only sound merchandise practice and is conducive to constructive building in the appliance merchandising field.

2. When combination sales are advisable, adequate margins should govern selling prices. Only the "true value" of articles should be stated in the advertising.

3. Deferred payments in connection with the sale of all merchandise are universal practice and are accepted by sound financial authority and favored by the public. A period not exceeding eighteen months is recommended as a maximum time allowance for load-building devices in the pioneering stage, and a period not exceeding fifteen months for financing motor-driven devices having general public acceptance. Relatively shorter terms, on a self-supporting basis, should be extended on items selling for less than $25. A carrying charge for financing service should be made in all cases and an initial payment be required large enough to constitute a sale.

4. The power company is in the merchandising business for the promotion of devices which constitute a medium of electric service. There are kindred lines of merchandise which are naturally used in conjunction with the appliance, but we suggest that it is not desirable for the merchandising department of the power company to engage generally in the direct sale of non-electric devices.

5. We recommend an adequate classification of merchandising accounts by the National Electric Light Association.

*From report of general merchandise committee.

Industry Public Policy*

Rate reductions outstanding achievement. Economic trends and public reactions. Government and the utility business

By R. H. BALLARD
Chairman Public Policy Committee

R. H. Ballard

ONE year ago in this city the National Electric Light Association held its fiftieth convention. As is customary when we pass one of the major milestones, our thoughts turned back to the early days of this industry which has contributed so much to our country's prosperity—to the earnest men who, in the face of every conceivable discouragement, persisted in their studies of the newly discovered force; to the progress of the new art, halting at first but gradually gaining momentum until every corner of the civilized world now pulsates with this invisible energy.

On such occasions we are prone to feel that our work has been good. It is not easily apparent where further progress can be made, yet in the year that has passed since the last meeting great things have been accomplished. In many respects it has been one of the most notable years in our history. In financial matters the stability of the industry has been evident in the widespread market for its securities to the point where they are held in ownership by millions of people. Technical progress of a remarkable character is shown in the constantly increasing efficiencies of our generating plants and transmission and distribution systems.

RATE REDUCTION OUTSTANDING

By intensive work in our commercial departments electrical appliances have been introduced into homes and factories in greater number than ever before. Not only does this mean greater comfort and convenience to the housewife and the artisan, but this larger market for our product, coupled with the increased efficiencies effected, has enabled us to make substantial reductions in our rates. In fact, rate reduction with continuous improvement of service is probably the outstanding achievement of the past year.

In the face of these constructive accomplishments, of which the buying public is the greatest beneficiary, the electrical industry has been subjected to a campaign of unfair publicity. Any investigation of the electrical industry which considers more than minor details will disclose that it has been developing along natural economic lines; that when unjustly attacked it has defended itself and has sought a fair hearing at the court of public opinion. The phraseology used by its critics is different, but when their remarks are carefully analyzed these are the things of which they complain: Ignoring the possibility that the same economic conditions which have brought about the chain store, the chain bank and the chain newspaper might also account for the chain utility, they have directed criticism against concentrated ownership and management, but only as applied to public utilities.

In the April issue of the *North American Review* there was a splendid article, entitled "Newspaper Mass Production," written by Roy W. Howard, the directing genius of a nation-wide chain of newspapers. In this article he argues that group production of newspapers is a sound practice in accord with present economic tendencies, by virtue of which the ultimate consumer is distinctly benefited. As the following quotations from Mr. Howard's article are read, it is suggested that the expression "public utility" or "electric power" be substituted for the words "newspaper" or "journalism" as they appear:

"The task of producing daily newspapers successfully is today a most complex operation, involving the superimposing of professional efforts upon a solid business foundation."

"Mere magnitude in an enterprise suffices to terrify a certain type of mind."

" 'Chain journalism,' as its critics prefer to designate it, is nothing more than the editing and operation of a group of newspapers in different cities by a single corporation or a group of corporations, with a centralized control."

"Chain newspaper operation needs no apology. Newspapers in the long run, almost without exception, succeed or fail according to their ability to serve the public interests of their community. What is true of a single newspaper is equally true of a group. That chain operation makes for financial stability even critics of the system will admit."

"A frequent objection to chain ownership is that it results in standardization. After all, the answer to this indictment is to be found in whether the standardization produces a better product for a larger number of people."

**Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

"Production of a daily newspaper of today has become a complex job—the work of highly skilled experts. Chain operation enables the mobilization of this high-priced talent at a minimum cost to each unit of the chain."

"The public has no desire to see this country governed by its newspapers any more than it desires to see it governed by partisan political bosses."

Your public policy committee submits that Mr. Howard's article is a clean-cut statement explaining why no American enterprise, newspaper or public utility, if it is to meet its obligations of adequate service to the public, can afford to ignore the natural economic trend.

That the electrical industry has taken steps to defend itself against the unwarranted attacks of a group whose every act indicates a lack of practical knowledge in business affairs is but natural. Theorists of this type have advanced unsound ideas from the day of our independence. They would remove from the electrical industry all of those men who have established its present sound position and in their stead substitute men whose guiding thought is political rather than economic.

Government in Business

When the leaders of the electrical industry, serving 95 per cent of the country's electrical output under private enterprise, take legitimate steps to inform the public of the unsoundness of these proposals, the cry of "meddling" is raised. Government in business professing opposition to the general application of government operation of the entire electrical industry, there are some who advocate that certain large projects should be governmentally operated. Under the false argument of establishing tests of performance, they would substitute government competition for regulation; they would compromise with vital principles underlying the nation's progress and would substitute the views of a small group in public or private life for those of the vast majority of the people who believe in private initiative and enterprise. Those responsible in public life for the local regulation of utilities are satisfied that the states are competent to regulate their own utilities and that there is no general demand for the federal government to enter this field.

In the far West it is proposed to build a gigantic power dam for the avowed purposes of flood control, reclamation and domestic water supply, although, in fact, these latter services would be jeopardized and delayed by their inclusion in an uneconomic power development program. In the South it is proposed to enlarge a scheme of government ownership and operation, in the hope that the greater enterprise may prove successful, although the lesser project has so far been an economic failure. In these regions are men who have spent decades in the study of local power needs and have carried out engineering enterprises to meet these needs. By the very nature of things these are the men who are best informed to advise the public regarding further power development, but when these experienced men attempt to speak they are met by criticism, coming from advisers of the people of the same type that heckled the founders of the Republic.

With the obligation of public service goes the responsibility of using due diligence in the development and the protection of our business and to conduct its operations fairly and efficiently. This we have endeavored to do.

Every business has certain facts with reference to it known best to those actually engaged in it. Time and experience have established these facts almost like the laws of the Medes and Persians. Those not experienced in a business are as likely as not to obtain somewhat distorted ideas concerning it. Indeed, it is not unusual to find people presuming to know more about the electric light and power business, for example, than the men who have spent their lives in it. It would seem, therefore, that this industry is not only well within its rights in presenting facts concerning itself to editors, educators, and to the public, but that it is in duty bound to do so.

The schools of the country are shaping the thought of the oncoming generation with reference to all business, economic and social matters, and it is important that they should have the facts. The electric development of this past decade has brought great economic and social changes, and your industry has been active in making available to the properly constituted authorities of the schools the facts concerning its development. What better source have the schools for obtaining information on the electric light and power industry than from those engaged in its development? Do men consult a lawyer when they are sick or a physician when they are in need of legal advice?

Principles for MERCHANDISING*

1. All discussions of the problems of the relations of light and power companies and dealers selling electrical appliances must be based upon proper and adequate service to the ultimate consumer.

2. There should be a segregation of the accounting of the merchandising departments of power companies from their public utility functions, and all items of expense incurred in the merchandising of appliances should be charged to the merchandising activities of the companies concerned.

3. It is recognized, however, that expenses incurred in the pioneering of appliances which have not yet met with sufficient public acceptance to be merchandise items in the stocks of local progressive dealers, and general advertising for the development of the market for appliance service, should properly be charged to the promotion accounts of the utilities and not charged to merchandising.

4. This conference recommends to power companies and independent dealers the necessity of constructive co-operation in their local fields for the better development of the electrical appliance business.

*From report of general merchandise committee.

Statements to thi

from the N.E.L.A. Convention

I HAVE an abiding faith in the integrity and the ability of the American public to deal fairly with our industry once it is possessed of the requisite information for the exercise of intelligent action and the formulation of sound judgment.

[*H. T. Sands*]

THERE is a force within this country mightier than your multiplied motors, dams or power stations, and that is the united heartbeat of the American people, and much as the orator would sweep his audience or the evangel move the erring, get your spiritual batteries charged and play upon the ideals and emotions of our people.

[*Clayton Rand*]

I FIRMLY believe that the electric industry will continue to be characterized by policies of fairness, open publicity and frankness, co-operation with public authorities, and above all by scrupulously living up to all the implications of its position as a public service industry, perfecting its machinery for self-regulation and control from within.

[*Melvin A. Traylor*]

NO AMERICAN enterprise, newspaper, or public utility, if it is to meet its obligation of adequate service to the public, can afford to ignore the natural economic trend.

[*R. H. Ballard*]

THE first plank in the platform of good public relations is good service.

[*E. C. Stone*]

IN 1927 a total of 246 utility companies in the United States sold directly to consumers 3,581,206 shares of stock having a par value of $263,527,269. The 1,681,768 customer-ownership stockholders have invested $1,600,000,000 in utility securities.

[*Philip G. Gossler*]

WE ARE just entering an epoch of development of the industry which demands the sale of more energy, and the company whose executive backs up his sales manager, not only with money, but with intelligent teamwork, will reap the harvest of more energy sales in full measure.

[*E. W. Lloyd*]

ALMOST daily we have brought to our attention examples of what wonders interconnection is doing in the way of improvement of service, and almost daily we are missing opportunities to tell our customers—to tell the people of the communities in which we operate—to tell the nation what we are accomplishing by interconnection, of what interconnection is doing, of the fundamental thing that we are striving for in interconnecting.

[*George N. Tidd*]

WE BELIEVE that the cause of public service in its broadest aspect can be best served and the development of the industry promoted by giving full play to inventive ingenuity, to constructive financing and to sane and logical extension of the service we give. We believe these activities would be stifled under political ownership and management.

[*Franklin T. Griffith*]

nk About

LET us take as our common objective the promotion of knowledge and integrity in the art of industry and in the upbuilding of manufacture and trade.

[*Deane W. Malott*]

THERE is no way to cope successfully with organized error except with organized truth. Only a renascence of patriotic interest in government on the part of the better-informed and more responsible elements of society can accomplish needed reforms.

[*John E. Edgerton*]

IF YOU are desirous of hastening the utilization of electricity in the solution of railroad problems, there is scarcely any service you can render of greater importance than that which looks toward the development and standardization of the art of producing electrical energy and its application to steam-railroad operation.

[*L. A. Downs*]

ELECTRIC utilities are essential to public wellbeing and are necessary to national welfare and national progress. The regulatory bodies and the public at large must not only seek protection against exploitation or oppression on the part of public service corporations, but must also seek for that attitude which will continue to foster private initiative and efficiency, to stimulate improved methods and increased effectiveness, to preserve superior facilities for the business man and the worker, to improve the standard of living for the American home. These ends will be attained not by litigation, not by regulation, but by intelligent and wholehearted co-operation of all concerned.

[*Henry G. Wells*]

I COME to the conclusion that your system of selling is incompatible with the best merchandising practice. It may be effective for the small store in the small town. But it conflicts fundamentally with the necessities of large-scale, economical and efficient merchandising practice, and a more effective way out must be found.

[*Oswald W. Knauth*]

THE farmer of today is machinery-minded and is thoroughly sold on the value of electricity. The farms of America offer to the public service companies a great undeveloped field for expansion, a field that is ready and impatiently waiting for that expansion.

[*Clifford V. Gregory*]

OF THE seventeen million wired homes in the United States, at least ten million are so incompletely wired as to preclude the possibility of extensive use of electricity in removing the drudgery from household tasks.

[*M. C. Huse*]

THE function of the investment or holding company is getting more and more to be that of adviser, and the authority to manage and operate is being more and more localized in the local officers of the company.

[*A. W. Thompson*]

SEVENTY-FIVE per cent of American industry is electrified. Power has wrought an increase in the value of products per wage earner from $1,000 in 1850 to $7,500 today.

[*H. W. Derry*]

THE purpose of a price policy in any industry is to develop the maximum of business at a minimum of cost, a result of mutual interest to producer, merchant and customer.

[*Edwin Gruhl*]

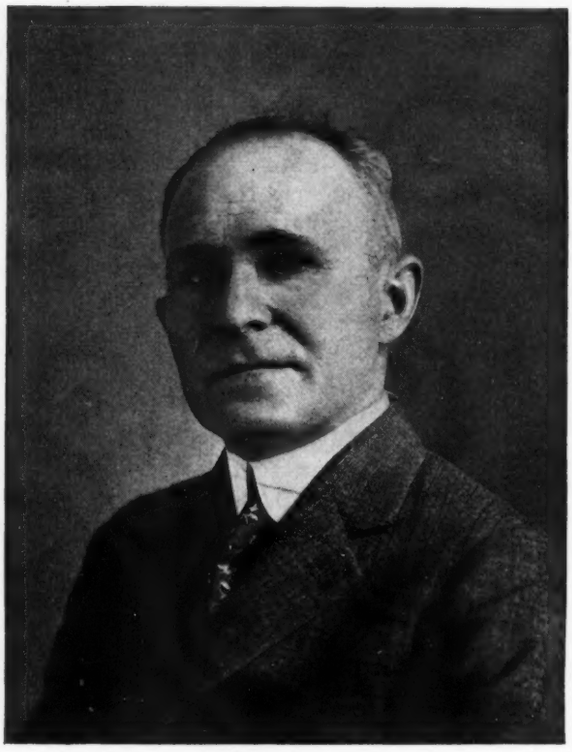
Golden Rule Relations*

The job of informing the public is the job of each utility man. New conceptions of service introduced. Executive interest necessary

By J. F. OWENS
Chairman Public Relations National Section

PROPERLY to inform the public we are privileged to serve is a function of our industry second only in importance to adequately, economically and efficiently serving that public. Both functions are vital to the well-being of our industry and our duty to the public.

Upon these fundamentals the committees of the Public Relations National Section based their program and their endeavors to vitalize the program during the year.



J. F. Owens

COMPLETE JOB NEEDED

Two major activities were undertaken as broad phases of the program which resulted from the organization meeting.

1. Encouragement, through committees peculiarly adapted and organized, of action on the part of member companies that would make for greater efficiency on the part of company employees, with particular emphasis on the necessity of executives informing and training those employees whose duties bring them in immediate contact with the public.

2. A clear visualization of our service relations to the public. Through the committees that were formed for the purpose of bringing member companies to a realization of these relations, the second phase of the section's functions was planned. Even though mechanical equipment may be the latest and best and thoroughly suited to the task of giving a full measure of service; even though the personnel may be loyal and industrious, yet this is only half the story. There is another party to the question of service. That party is the public. It matters little that the mechanical and human equipment of the organization be all that any one could desire; that the service be above criticism, if the second party to the service contract is not fully informed, thoroughly cognizant of what it is getting in the way of service, and satisfied that the service is being furnished at the lowest possible rates. Therefore, the public must be informed.

Perhaps the major activities during the past year have been directed toward awakening member companies to a keener realization that their job is only half done when service is made available at the meter, accounted for and payment made, but that quite as much their duty as the rendition of service, is the complete dissemination of such information as may enable the recipient of service to use that service wisely and well, and over and above all such information, presentation of such facts about the service as will prevent him from becoming an easy prey of demagogues with only self-interest to serve. The customer must know that his service can approximate perfection only when he, the second party to the service, responds with that full measure of co-operation, born of a knowledge that he not only is being adequately served, but that he is being honestly served.

On this premise the executive committee of the section early in the year requested headquarters staff, under the direction of George F. Oxley, director of public information, to prepare for submission to the committee a series of advertisements that might either be used by member companies or serve as suggestions in the preparation of copy for their own advertisements. Advertisements were prepared, approved by the executive committee, and a weekly newspaper advertising copy service inaugurated. These advertisements are being widely used throughout the United States.

The effect of this movement has been twofold: First, the advertisements themselves carried a terse, definite message to the reading public—a message drawn from men and women of our country whose opportunities to study and evaluate the electric light and power industry of this country have been notable. It brought to the people of the country observations of men and women, who, through their achievements, have reached places

*Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.

which warrant their statements being accepted at par. Second, as valuable as the effect of the advertisements themselves, is the attendant effect on member companies, hitherto not consistent advertisers: a realization effected that they have only been partially discharging their obligations to the public when they content themselves with merely rendering service, without providing with it a full and complete fund of information to insure proper use of that service by customers. Thus, the advertisements performed a dual mission.

More "White Space"

The committee believes that the press is the best medium for disseminating information. It believes that it is the duty of every utility company to utilize the press, through paid advertising columns, to give to the public a straightforward, well thought out and carefully prepared account of its stewardship. But it is recognized that we cannot overlook other media of information—the spoken word, the daily contact of employees with their neighbors and friends. All possible factors should be utilized in giving true information about our business.

There can be no doubt but that in the past there has been a contest, if you please, between the demand, on one hand, by customers for service, and, on the other, the necessity for securing capital and equipment to provide that service. The time and attention of those responsible for the company's performance have necessarily been devoted to what might be termed the material side of rendering service. While executives and their co-workers have been busy selling to financiers the opportunities that lay ahead of them; while new demands for service have created conditions that required new equipment, naturally the genius of the industry has been turned toward its material development. Men have been busy thinking out ways to do new and better things than they ever did before. Superintendents devoted their time and effort to reducing manufacturing costs, cutting down transmission losses and effecting operating economies. Inventors were developing new equipment and new appliances for greater utilization of service.

The job is only half done when service is made available at the meter, accounted for and payment made.

Every utility company should utilize the press, through paid advertising columns, to give to the public a straightforward, well thought out and carefully prepared account of its stewardship.

The commercial man, as he goes forth to interest a prospective customer, visualizes himself as a bearer of good tidings.

In short, the best brains of the industry have, of necessity, been chiefly concerned with the material phases of the business. Service demands increased day by day and the industry grew by leaps and bounds. Exigencies of the hour demanded greater efficiency in generation and larger units of production and operation. These conditions called for consolidation. Small, inefficient companies must unite in order that the economies that come only through employment of large manufacturing units could be secured.

Executives were busy doing the job. Their energies were directed toward this internal development. While this was going on, there were others who, prompted by purely honest motives, were beginning to fear the size to which the industry was growing. And there were others with less worthy motives, who saw an opportunity to capitalize this fear and who, by the utterance of untruths, half-truths, or distorted statements, wilfully and sometimes maliciously encouraged the somewhat latent fears of many right-thinking men.

It was then that leaders of the industry awakened to the realization that they had left at least half of their job to those who, either through lack of understanding or unholy motives, were making a miserable botch of it.

Far-seeing men determined that organized effort must be made in an attempt to bring every member company to a realization of the truth; that in addition to the rendition of service at the lowest possible rate commensurate with good service, their trusteeship to the public demanded that the service carry with it the information which they alone were in a position to provide and that a vital element in stability of service and service companies was public co-operation.

In former years the engineer was content if his turbine measured up to standard and met all of the known tests for satisfactory performance; if his transmission lines met the requirements of recognized engineering standards and practices; if his substations were adequately and properly built and if his meters were accurate. The accountant was content if his records presented a true picture of the company's operations; if he could supply the executives information necessary for a study of the company's operations and a forecast of future requirements, and if bills for service were accurate and complete. The commercial man felt that his job was adequately performed when he secured a contract for service.

Today, the engineer sees not only his turbine as machines; his transmission lines as so many poles, wires, insulators and anchors; his meters as accurate measuring devices. His vision extends through and beyond these material elements to the ultimate customer. He pictures himself as the instrument, through whose genius a service is brought to a waiting public, a service that shall shorten hours of labor and provide moments of leisure that may be employed in a development of the finer things of life, the training of mind, and permit a reaching out for cultural advantages that make for complete manhood and womanhood. The accountant knows that his records are more than mere figures upon reams of paper. He realizes that service bills transmitted to customers offer an opportunity to carry a distinct message, a readable message to be easily understood and analyzed by one who does not understand the technicalities of modern bookkeeping. The commercial man, as he goes forth to interest a prospective customer, visualizes himself as a bearer of good tidings. He senses that securing the contract is only half the job; that it is his duty to give the customer a friendly understanding of the company he represents; that the customer be made to know that the company's mission is not fulfilled when a plant is physically connected to his lines. He realizes that his job as a company representative is only begun when he secures the customer's business, and that his major obligation is to keep in constant touch with the customer, to be his friend, his confidant, his adviser

Philip G. Gossler
Chairman Committee on Customer Ownership

Homer E. Neisz
Chairman Committee on Industrial Relations

Miss Sophia Malicki
Chairman Committee on Women's Work

W. S. Vivian
Chairman Committee on Public Speaking

and to be on such a footing of mutual understanding that the customer will call on him instinctively for counsel and advice in the utilization of his service.

But men come and go, engineers change and give their places to others. Customers change too. If it is true that our job is only half done when, as utility men, we inspire the members of our organizations to realize the largeness and the opportunities of our business and that they are really emissaries of a new order; if it is true that half our job is to fully inform our customers concerning our companies, our policies and our aims, then this task of creating and maintaining proper relationships with our public is never ending. More and more will it require the best thought and brains of the industry to bring about and safeguard a mutual understanding. More and more are we not only justified, but definitely obligated, to employ every legitimate means to properly inform and impress the public. More and more will it be necessary to employ the best methods for the dissemination of ideas, to provide the facilities of a clearing house for information and practice and to encourage the laggards, if there be such. The claim upon our industry of this obligation is quite as definite, if not as insistent, as the obligation of service.

The Public Relations National Section functions, in its present set-up, through eight separate committees. Each of these is submitting a report of its activities during the past year and each has pursued a course of action, predicated upon the major functions of the section, as outlined in this report. Some of them, particularly the women's committee, include both major functions. The work done by these committees merits a comprehensive and detailed report. But the men who have been responsible for this work are best fitted to tell the real story of their operations and their reports are being presented at this convention.

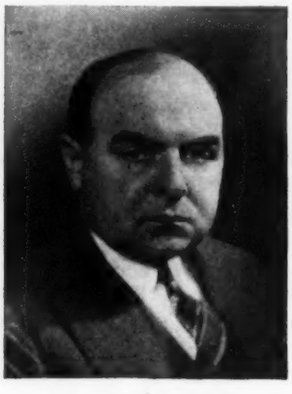
Investment Diversification Good

By Dean John T. Madden
New York University

THE tendency that will show itself more and more clearly is that of lessened investment in individual companies and a broader diversification in the investments in order to distribute the risk. The investor in securities of an electric light and power investment or holding company has at once diversification and distribution of risk, and if the investor happens to be a manufacturing corporation, it, too, has additional diversification and distribution of risk.

If the trend toward one of the several forms of amalgamation is to continue—and it probably will—the investment company may be one of the devices by which the number of loss-producing companies will be reduced. I can unhesitatingly say that history will reveal public utility financing to have been more free from taint than that of any other industry taken as a whole.

T. J. McManis
Chairman Committee on Manufacturers' Advertising



T. A. Kenney
Chairman Committee on Information Bureau Organizations

W. A. Jones
Chairman Committee on Relations with Financial Institutions

Carl D. Jackson
Chairman Committee on Co-operation with Educational Institutions

Utilities and the Public*

Electrical industry faces a critical situation. Its future depends on its own actions. Regulation and rate of return

By HENRY G. WELLS
President National Association of Railroad and Utilities Commissioners

Henry G. Wells

TODAY the electrical industry is prosperous. Its growth has been rapid. The possibilities for the future are tremendous. But already there are signs of unrest, and the responsibility is upon you to determine by your acts whether the industry shall continue on its course normally and properly—whether the great mass of the public shall continue to have confidence in those in charge, or whether those who are at the moment attempting to discover evils to present to the public are to receive encouragement from some in your midst who may adopt unwise policies and unfair methods. The public will not be governed by what you say but by what you do. They look not for promises but for results. If an investigation develops any substantial number of facts that the public does not like, it will not only be those involved who will suffer but the whole industry.

If a small minority of your membership fails to live up to the principles of this organization, the organization suffers. Strenuous moral suasion may be necessary on the part of the majority to protect itself from the results of unwise action of that minority. The great mass of the public today do not sense any great evils; they are not convinced that there is anything substantially wrong. But it may not take much to change the picture. And so it behooves those directing and guiding this great industry to walk circumspectly. They must be fair. They must be not too selfish.

Because an industry is big and because it has had a tremendous development it furnishes an opportunity for attack. But the American people today as a whole do not get enthusiastic over attacking anything merely because it is big. Henry Ford has built up one of the largest industries in recent years, yet has been comparatively free from hostile criticism by the public—at least while he confined his activities to his business. And so, while the size of your business furnishes an ample target for the few, your conduct can be such that the acquisition of recruits to shoot at it will be difficult.

FACTORS OF RESPONSIBILITY

There are two factors in the case of the electric industry which make it even more imperative to realize the great responsibility involved: First, the electric company is usually a public service corporation; second, as such it is granted privileges by the state and municipality and even in most cases allowed a monopoly in its business.

Many arguments are presented from time to time to justify certain acts of the utilities because in many respects the utilities have factors of ordinary business, but often it is evident that the utility officials overemphasize those factors and do not sufficiently recognize the distinction that exists and which should control in their public and business relations. The utility industry is protected in many ways because it is a public service corporation. It enjoys many advantages that private industry does not enjoy, but it must expect to assume the duties that go with such privileges. There are some rights, however, that are common to all industry and all individuals.

The electric utility, like any other industry, has a right to be heard. It has the same right to present its views on matters affecting it as any other business. The electric utility, like any other industry, has a right to have its spokesmen at gatherings of the public. It has the same right to publish its articles in newspapers and magazines as has any other interest. The electric utility has the same right as anyone else to see to it that the education of the young shall contemplate both sides of any question.

The electric utility, like any other individual or organization, has a right to be represented at Washington and the various state capitals by its own officials or by paid attorneys—call them lobbyists or what not—so long as they conduct themselves properly. It has the same right to protect itself from unjust attack as is granted to others. It has the same right to correct false and misleading statements as anyone else.

It is an interesting situation when some of the stanchest advocates of free speech are attempting, by means of investigation, to give out the idea that a great and useful

**Abstract of address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

industry has no right to protect itself by means of free speech. It is an interesting situation when advocates of municipal or governmental ownership can set forth their arguments orally, by written articles in newspapers and magazines, and can even be found in the schools and colleges teaching the youth of the land the advantages of such a doctrine, yet they would deny you the same privilege. In one case it is educational, in the other it is propaganda.

Any fair-minded citizen will grant your organization the same right to present arguments for private ownership. Any red-blooded American will grant you the right of self-preservation by means of speeches, magazine or newspaper articles and proper instruction to the youth of the land. But there are certain obligations attendant upon these rights. The public have a right to expect fairness, no misrepresentations, no distortion of facts, no concealment, no evasions. It must be the spreading of truth and not misleading propaganda. They have a right to expect ethical conduct on the part of paid attorneys or agents.

Holding Company Function

One or two weaknesses at this critical time may well be pointed out with a view to preventing the increase of recruits seeking pot shots at the large-sized target of the electric utility. One of them is the holding company. The value of holding companies, properly administered, is well recognized, in the co-ordination of common interests, the unification of a common purpose, the strengthening of the weak by the strong, the stability given to new financing and expansion and the possibility of better and more adequate service. But that strength is a source of weakness when directed to selfish purposes. When any company becomes primarily a stock-jobbing concern, when its aims are directed solely to the benefit of the speculators in such securities and not to the benefit of the subsidiary companies and the public they serve, then the public has a right to complain. When any such holding company issues securities far in excess of the worth of the underlying companies, it is a source of danger to the public. When any such company attempts to conceal excessive profits on the part of some or any of the subsidiary companies, such a policy is naturally the object of criticism and attack on the part of the general public.

Another potential breeder of target-shooting recruits has developed recently in my own state. And it isn't localized either. The same attitude is apparent in spots throughout the country, and the majority of regulatory boards are watching the situation with increasing interest. It is the attempt to set up reproduction cost as the sole factor in a rate-base valuation, coupled with the payment by large interests of exorbitant prices for the stock of well-managed and prosperous companies, relying on that type of valuation to secure a return on those high prices. It is only necessary to quote from one of your trade magazines to indicate where this may lead. Referring to a recent case, this magazine says:

"In one sense, it is to be regretted that the situation in this particular case did not require the court to find definite values for the physical property for actual (not theoretical) depreciation and for going value, and that it did not state what actually constituted a fair rate of return."

That should not be the attitude of the utilities, to advocate making the United States Supreme Court a fact-finding body. How far we have traveled since the early decisions under the Fourteenth Amendment. How much farther do you expect to travel? To my mind, the situation warrants a word of warning.

Reproduction Cost

Reproduction cost assumes the reproduction of a plant which would never be reproduced exactly as is. It apparently assumes valuing a plant on a basis which would not always be considered in determining its value for some purpose other than for rate making. It often involves long and expensive investigations, complying with elusive requirements, and recognizing cumbersome theoretical opinions of experts, resulting finally in a composite guess. And when this composite guess is finally determined, the factors on which it is based may have changed so that it can no longer represent the true value and the whole process may have to be repeated. In fact, it would be quite possible to have a company before the regulatory commission and the courts almost continuously. "It does not enable justice to be done speedily and efficiently either to the public or to the investor. In periods of enhancement of prices the public may be compelled to pay excessive rates. In periods of depressed prices the investor is compelled to receive less than a fair return upon the capital invested." At times when companies might need speedy relief in the shape of increased income such relief might be unduly delayed. One wonders what the attitude of some companies will be if there comes in the course of the next ten years a marked decline in prices below present levels, particularly those companies a substantial portion of whose plants was built shortly after the war during the era of very high prices.

Of course, you will ask, what then will be the attitude of regulatory boards? Will they insist then upon reproduction cost as a base, as the public did in the first instance? And, no doubt you will quote Smythe vs. Ames, wherein the public's representatives were arguing for just such a basis as the companies are today claiming. Frankly, that ought not to be the position of the public or the regulatory boards. We hear a great deal about the prudent-investment theory of Massachusetts, but some of us are not committed to that as a proper theory to be binding upon us. Neither do we believe that with changed conditions the public would force us to adopt the reproduction-cost theory as the proper one unless we are forced to adopt it at the present time. We have had regulation for many years in Massachusetts and have not insisted on any hard-and-fast rule. We have sought and are now seeking simplification, and we believe that ought to be the aim throughout the country. Somehow it has seemed as though the coining of the word "valuation" was a mistake. "A fair return upon the fair value of the property" was a glib phrase which served its purpose at a time when conditions as to regulation and capitalization were more or less chaotic. But is it necessary today? Rather, is it not an unfortunate phrase when applied to present-day conditions? After all, is not the whole proposition an economic problem, pure and simple.

Rate of Return

If rates are allowed or fixed sufficient to pay all proper operating expenses and maintenance charges—to pay taxes and interest on indebtedness, to set aside an adequate depreciation reserve and have a reasonable surplus left over after the payment of such dividends as will keep the market price of stock issued under the authority of the commission for proper capitalizable purposes at

such a figure that new issues may readily be marketed having in mind the purchasing power of the dollar and its fluctuations—can any one say there has been confiscation in fact, whatever theoretical experts may argue? And those facts are not hard to determine. Operating expenses and maintenance charges are available from year to year from the annual returns, and the necessary evidence to show any present changes in them would not take long. The same is true as to interest and taxes. There would seldom be more than a slight difference of opinion as to depreciation, and any regulatory board must recognize the importance of allowing an ample amount for that purpose. Market value of the stock-purchasing power of the dollar, amount of dividends and of surplus are all matters of judgment, fairly easy of determination in the light of existing conditions at the time.

If economic conditions change, only a few weeks at the most would be required to change the rates. Some may say, "But that means prudent investment as a base." Not necessarily. Granted that indirectly most cases would work out that way—and probably therein rests the widespread opinion as to the so-called Massachusetts rule—yet one can readily imagine conditions arising where rates would be allowed more than necessary to pay a fair return upon the prudent investment but which, nevertheless, were deemed necessary from an economic standpoint.

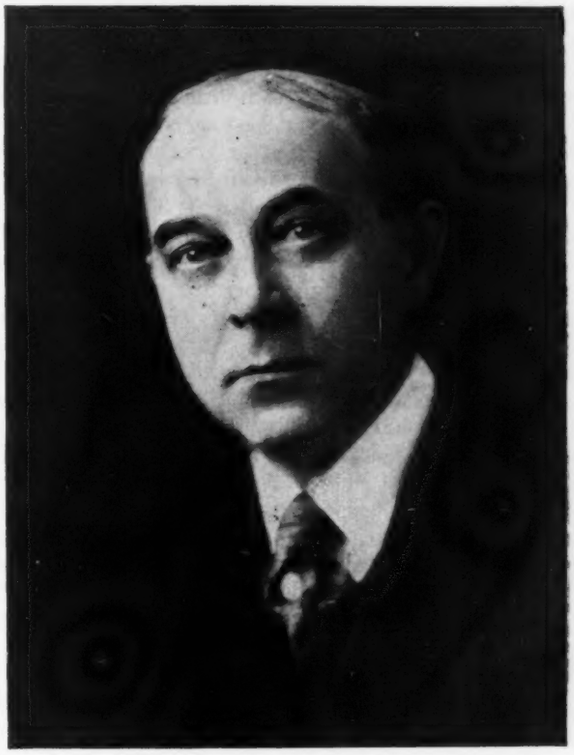
Sounds simple, doesn't it? Regulation in Massachusetts *was* simple up to a year or so ago, and none of the companies complained that we were taking their property away from them. But now, instead of the few weeks formerly required for a rate case, what do we have? We have had some cases in which five or six months is required to present evidence to us, and probably two or three or more years will elapse before the court tells us whether our decision was right or wrong. And at the end of that period of time undoubtedly conditions will be such as to warrant starting the farce all over again. It will be unfortunate for the public and for the companies if that tendency becomes general. When extremely prosperous companies adopt this attitude, the public can only see a pretext to deprive them of what they are morally entitled to, a fair share in the prosperity, whatever may the legal principles involved.

Some of you are doubtless beginning to think I am unduly petulant over this matter. Rather am I apprehensive. It is brought to the attention of this great organization as a "stop, look and listen" signal. You ought to know wherein danger to your future can be minimized. You are facing a critical period in the history of the industry. There are those seeking to hamper you, and undue selfishness merely helps them in their aim. If what I have said seems unduly critical, it is said with the best of intent, to preserve this great industry for the benefit of the public and itself.

Electric utilities are essential to public wellbeing and are necessary to national welfare and national progress. The regulatory bodies and the public at large must not only seek protection against exploitation or oppression on the part of public service corporations, but must also seek for that attitude which will continue to foster private initiative and efficiency, to stimulate improved methods and increased effectiveness, to preserve superior facilities now provided for the American business man and the American worker, to improve the standard of living for the American home. These ends will be attained, not by litigation, not by regulation, but by intelligent and wholehearted co-operation of all concerned.

Reducing Insurance Costs*

By CHARLES B. SCOTT
President Bureau of Safety, Chicago



Charles B. Scott

THE growth of the electrical industry and the present large units of organization have brought exceptional opportunities and responsibilities to every one in the organization to co-operate with the management in eliminating needless waste and effecting possible economies. The accountant has exceptional advantage in being able to assist in such an important undertaking because of constant evidence before him of these items of expenditure and their effect upon earnings. His opportunities also come from his relationship with the treasury department in maintaining the proper financial structure.

The insured usually interprets his insurance as a betting arrangement by which he may escape the payment of his losses because of his more advantageous end of the wager and the attractive odds offered. It should be needless for me to assure this audience that such an idea of insurance protection is entirely wrong. The fundamental laws of compensation apply to insurance, and eventually the insured must pay the penalty of his negligence and misfortune. The insurance company really finances these penalties over a period of time and thus makes the burden less noticeable. When the final accounting is made the insured and his associates receiving protection must not only pay the losses involved, but

**Abstract of address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

in addition to these the cost of administering the insurance business plus a reasonable return to the insurance company's stockholders.

For some reason, difficult to explain, the average business organization and individual carrying insurance handle insurance matters rather indifferently. Purchases of materials and supplies are made in a businesslike way The purchaser knows what he is buying and the fairness of the price paid. Insurance is too often purchased without any definite knowledge of what is being bought and with only a vague assurance as to the meaning of the policy granting the protection or the reasonableness of the cost.

This situation is in part due to the idea that coverage and rate making are highly technical and that rates once officially promulgated cannot be lowered except by some costly process of construction or alteration of property, or in the case of casualty insurance by some cycle of good luck in accident experience which may automatically reduce the cost of casualty protection.

For the public utility company insurance is a means of relief from the immediate payment of unexpected losses, a safeguard for uninterrupted service and a protection against catastrophe. Attention is particularly directed to that feature of protection applicable to continuity of service so essential in the public utility business. Service may be quickly and seriously impaired or discontinued by damage to the plant or equipment, and the consequent loss of business may impose a serious burden upon the company. To protect the investors and customers it becomes necessary to guard against such losses as may result from interrupted or discontinued services. Therefore proper coverage and protection measures should be employed, even though they be only for the prevention of consequential losses.

The electrical industry is now paying just rates of premium for fire insurance protection. This assurance was brought about several years ago and has been steadily maintained by the efficient and businesslike attention given to insurance costs by the insurance committees of the National Electric Light Association. The present committee and its predecessors have diligently kept a record of rates charged and losses sustained and have received the most hearty co-operation of the insurance interests in keeping the proper balance between these factors of rate determination. The appreciation of the members of the association is due its insurance committees and the co-operating agencies and representatives of standard fire insurance companies for this service, which has not only resulted in broader coverage, just rates and improved methods of fire prevention, but also in a better understanding of the mutual interests of the electrical and insurance industries.

Possibilities of Cost Reduction

There is no intention, however, to cover the subject of insurance in the broad and general way indicated by what has been said, but to deal with the possibilities of economy in insurance costs and with a somewhat literal interpretation of this term as it is applied to the costs reflected in premiums paid for protection. Such costs when compared to payroll and other large operating items may not by such comparison alone appear to be of great importance, but if those costs are susceptible of material reductions, then their import becomes established. The task of reducing some of these larger expenditures to any appreciable extent may, and no doubt is, much more difficult than a reduction of insurance costs, and to properly evaluate the latter the possible savings rather than the comparative volume of expense should be kept in mind.

Structural changes in the physical property provide the more frequent opportunities for reduction of premium rates for both fire and casualty insurance. Recommendations for such changes in structure and the installation of safeguards usually emanate from the insurance broker or safety engineer and are often given little attention because of a preconceived idea that such recommendations are seldom practical or of material consequence. It is true that some of the recommended expenditures for changes may not be reflected in lower rates, but even these may be of great importance for the protection of the property or employees or in the interest of uninterrupted service.

Reclassification of Payrolls

A proper classification of payrolls has a distinct bearing on just and proper rates charged for casualty insurance. This may be illustrated by the proper allocation of the payroll of office workers in the engineering department to the office classification payroll and the lower rate thereon, instead of to the classification of payroll and rate applying to other employees of this department who are exposed to construction hazards and properly subject to the higher rate. Frequent revisions and proper arrangement of payrolls in accordance with the several risks and differing rates should be made and may often result in substantial savings in liability insurance costs.

The third factor in all rate changes is that of loss experience. Herein lies the most prolific source of economy and the factor requiring special consideration. Loss experience is controllable. Time will not permit an amplification of this thought, about which so much has been said. It is sufficient to emphasize that the prevention of accidents and fires can be accomplished only by intelligent and constant attention such as is given to the other operations of the public utility. This attention must be assured by systematic plans of organization and by the interest and co-operation of every employee. Well-planned and efficient accident and fire prevention work will establish better employee and public relations, prevent service interruptions and eliminate those incidental costs of accidents and fires not covered by insurance.

The desirability of the insured to assume a part of the risk has always been recognized and made possible by the co-insurance provisions of insurance coverage. The proportion of the risk to be thus assumed by the insured depends upon the character of the risk and the ability of the insured to bear his proportion of the loss immediately. It is the usual practice for the insurer to assume four-fifths of the risk and for the insured to become a self-insurer for the remainder. The question as to what proportion of risks, or as to total risks, which may properly be considered for self-insurance is particularly apropos for public utility companies. This is especially true of those engaged in the manufacture and distribution of electrical energy who maintain metropolitan plants of large values or those whose properties are established over wide areas with widely distributed units of value. Such companies have exceptional opportunities and advantages for economies in insurance costs through self-insurance plans.

By such plans properly and soundly established economies are possible through the elimination of large administration expenses, including acquisition costs imposed upon standard insurance companies. There are other ad-

vantages in dealing directly and justly with injured employees and the public, reflected in a closer and better relationship with these possible claimants.

Any self-insurance plan to be successful must be most carefully decided upon and must be based upon those sound principles of finance, law of averages and prevention of loss which form the foundation for the successful standard insurance carrier. Having established such a plan, charges for protection based upon standard rates should be collected and wisely administered. A most carefully developed plan of adequate excess and protection against catastrophe must be provided as a part of any such successful arrangement for intercompany self-insurance. More important than anything else, an agency must be provided to minimize fire and accident losses. Success is impossible unless well-organized, intensive and continuous efforts are maintained for the prevention of losses incident to the risks carried.

Insurance, insurance costs, protection, improvement of property and personnel, uninterrupted service, conservation of waste and economy in operating costs—these are of unquestioned importance and merit the attention of all of us who share the responsibility for a careful administration of our trust.

Electrification Surveyed*

Conditions in Europe and America studied. Recent electrification projects. No need for standardization

By Britton I. Budd

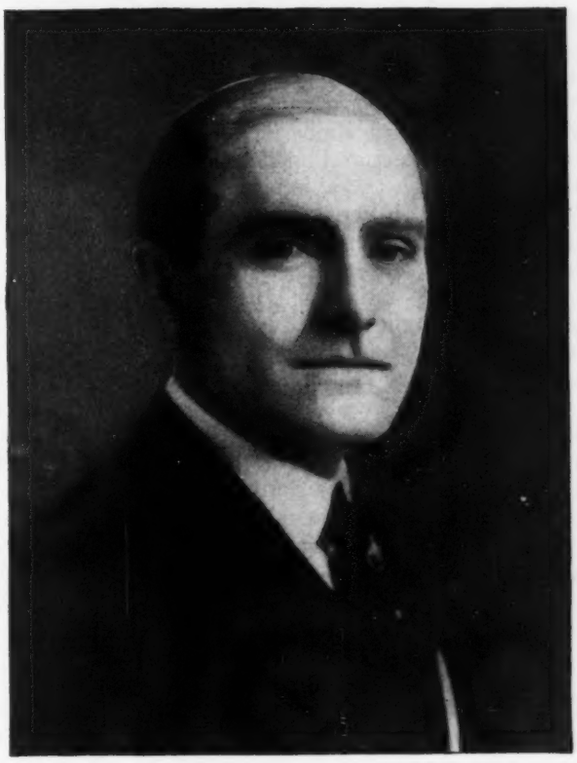
Chairman Committee on Electrification of Steam Railroads

THE past year has seen an extension of electrification in the United States, most of the larger European countries, South America, Australia, India and Japan. Initial installations are being made in some of the smaller countries like Costa Rica, Czechoslovakia and Siam. Several of the European countries are at work on programs for electrification which will take years to complete but on which substantial progress is recorded every year.

In Great Britain electrification is still confined for the most part to suburban passenger traffic. No through service has been electrified as yet, but extensions of the suburban systems are constantly being made. In Holland considerable additional track has been electrified for passenger service only. Sweden recently completed electrification of one long line for general traffic purposes. France, Germany, Switzerland and Italy continue to extend electrification to new sections. At the end of 1927 Germany had 750 miles of road electrified and was proceeding with 185 miles more. Switzerland had 1,250 miles of standard-gage routes electrified and 150 more miles scheduled for 1928. Italy has about 750 miles of electrified routes in 1927, with 200 miles scheduled for completion in 1928 and expectation of about 1,400 miles by the end of 1930.

Lines operating into Warsaw, Poland, and Prague, Czechoslovakia, are being electrified and may be in operation by the time this report is printed. Three new standard-gage lines are projected between France and Spain across the Pyrenees. Some of the work is now under way, and it is reported that two of the lines at least will be electrified. Several of the smaller European countries are reported to be making studies of electrification,

**Abstract of report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*



Britton I. Budd

The Indian government is working on ambitious plans for electrification of a large extent of the principal lines in that country. Two railroads are already operating by electric power in the vicinity of Bombay, the first having gone into service in 1925 and the second in 1928. Both these roads plan to keep on extending their electrified sections for several years.

In Central and South America there have been several extensions of electrification. The Mexican Railway Company has extended its electrification, the Paulista Railway of Brazil has extended also, and the Western Minas Railway has ordered its first electrical equipment. The Transandine Railways in Chile and Argentina, which are operated as a unit, are electrifying and the Chilean section has been completed. In Canada the Canadian National Railways have announced that they

will build a new terminal at Montreal and use electric traction in the city.

In 1927 the Chicago, Milwaukee & St. Paul Railway completed the extension of its electrification from Black River to Seattle. This extension was about 10 miles of double track and brought the total length of track electrified up to 881 miles.

The Illinois Central Railroad completed in 1927 the first full calendar year of electrical operation on its Chicago surburban service. Electrical operation began in August, 1926. The last steam schedule was for 396 trains per day. The number has been gradually increased up to 566 trains on week days in April, 1928. Express service has been added on some lines and more frequent service to most stations. The running time of the different services has been shortened by 11 to 28 per cent. The response of patronage showed about 19 per cent more rides in 1927 than in 1926.

The Virginian Railway also completed its first calendar year of electrification in 1927. The first short section of electrification was placed in operation in September, 1925, but the entire electric zone was not in service until September, 1926. Officials of the road express satisfaction with the new motive power, which has greatly facilitated their movement of heavy-tonnage trains over mountain grades.

The Pennsylvania Railroad is engaged in a large electrification project at Philadelphia. A new passenger station for through traffic is being built on the west side of the Schuykill River. An underground station for suburban traffic is being built in the heart of the city near the old Broad Street station. All operation into the underground station will be electric, and the electric trains will connect the two new stations with each other through a four-track subway. Two suburban services to Chestnut Hill and Paoli have been electrified for several years. Two additional surburban routes are now in the process of electrification and are expected to be completed in 1928. One line extends to Chester and Wilmington, 28 miles south of Philadelphia. Electric operation on this line is scheduled to begin about the middle of the year. The other line extends westward from Philadelphia to West Chester via Media, a distance of 27 miles. This electrification is expected to be ready by early autumn.

Cascade Tunnel Nearing Completion

The Great Northern Railway on May 1, 1928, holed through its new Cascade Tunnel. This tunnel is nearly 8 miles long, the longest in the Americas. It is within the Great Northern's electric zone and will be equipped for 11,000-volt overhead trolley like the old tunnel which it replaces. The old tunnel was originally electrified by itself in 1909 with three-phase alternating current. This was changed in 1927 to the present single-phase system in anticipation of establishing an electrified division extending about 75 miles. It is expected that the new tunnel and approaches will be ready for service in the fall of 1928.

The Philadelphia & Reading Company has been engaged for some time in drafting plans for the electrification of its Philadelphia suburban service. The Boston, Revere Beach & Lynn Railroad has announced that it will electrify. This is a high-speed, narrow-gage road carrying suburban traffic between East Boston and its terminals at Winthrop and Lynn, Mass. The Detroit, Toledo & Ironton Railroad has been operating by electricity over 18 miles of its route between Fordson and Flat Rock, Mich. Electrification is now being extended a distance of 27 miles from Flat Rock to Petersburg Junction.

During April, 1928, the Delaware, Lackawanna & Western Railroad announced plans for electrification of its New York suburban service. The electrification will follow the main line from Hoboken to Dover (via Newark and Summit) with two branches to Montclair and Gladstone. The total mileage is said to be 78 miles of route and 173 miles of track. Detailed specifications have not been announced, but it is estimated that construction will be completed in about two years. This project has an interesting and rather unusual feature in the support being given by the communities affected. Representatives of civic organizations in all these communities, with a population of about 1,250,000, presented a petition to the railroad asking for electrification and pledging co-operation in securing an advance of commutation fares to support the improvement of transportation facilities.

The Cleveland Union Terminals Company, which is constructing a new union station in Cleveland, has called for bids on electrical equipment. It is expected that it will soon announce the details of the proposed electrification.

Systems of Electrification

Some countries have taken definite steps to standardize on a system for all future work and in certain cases have gone so far as to rebuild previous electrifications to conform with the new standard. In general it may be said that the central European and Scandinavian countries favor low-frequency alternating current at a high voltage. The standard system in these countries uses single-phase energy at $16\frac{2}{3}$ cycles with 15,000 volts at the trolley wire. A secondary standard is used in Germany for suburban service with direct current at 800 volts.

England and the western countries of Europe are using direct current at voltages from 600 to 1,500, with third-rail for suburban lines and overhead trolley for the longer lines. The English colonies are following the lead of the home country, as also are those railroads in South America which look to England for their technical advice.

Italy has had a long experience with the use of three-phase energy at 3,300 volts and is proceeding with the general electrification of long-distance lines on this basis. It is interesting to note that experimental installations are being made with high-voltage direct current and still higher voltage for three-phase.

In a report to the Sectional World Power Conference in 1926 H. Parodi of the Paris-Orleans Railway gave his view of the adoption of standard systems in Europe. He stated that the two general choices of system have grown up around different and distinct conceptions of the relationship which will be maintained in the future between the railroad and power industries. France, England, Belgium, Holland, Japan, South America, Africa, India and Australia have followed the policy of utilizing the power stations producing three-phase current for industry and of distributing the power for railroads and industries through a single system of high-tension lines. Germany, Switzerland, Austria, Norway and Sweden have followed the policy of creating two separate systems of generation and transmission for industrial power and for transportation, the railroad power system being single-phase with a frequency of $16\frac{2}{3}$ cycles while the general power system is three-phase and

50 cycles. He notes that the countries in which the railroads are privately owned have paid most attention to the general interests of the country, while the countries where the railroads are government-owned have neglected the advantages which might accrue from a single unified or interconnected power supply system.

Conditions in United States Different

In the United States, of course, conditions are quite different from most of the European countries. Electrification has been adopted here for specific purposes in widely separated parts of the country. Each railroad has attempted to employ the system best adapted to its own particular problem. The results have been generally satisfactory with whatever system has been adopted, as is testified by the operators in each case.

There has not yet developed a general need for standardization on account of the overlapping of the various installations or of the necessity for interchanging equipment. This has resulted in the United States retaining an important position as a proving ground for all the best and latest improvements in electrification. Both direct current and alternating current are being extensively used, and the voltages vary from ordinary street-car practice up to 22,000 volts.

Among the equipment which can be used on any existing 11,000-volt system are the New Haven locomotives with series motors, the New Haven locomotives with motor-generator sets, the Norfolk & Western locomotives with induction motors, the Virginian locomotives with induction motors, the Great Northern locomotives with motor-generator sets and the Detroit, Toledo & Ironton locomotives with motor-generator sets. Thus there are in this country five widely separated roads performing entirely different services with locomotives of special type developed for their individual needs, but which could, if required, be operated over the same electrified system. Taking power in similar form, they have the separate advantages of single-phase, three-phase and direct-current motors for their respective duties.

There are also two railroads which have locomotives adapted to run on either 11,000 volts single-phase or 600 volts direct current. The motor-generator locomotives with 600-volt traction motors can also be adapted to run on a 600-volt direct-current supply. There is no present indication that the several well-established systems of electrification are going to decline in favor. It is not unlikely, however, that there will be further developments in the interest of interchangeability between roads as there have been in different motive-power equipment for varied duty on different divisions of the same road.

Operation in the United States

A study of electrification during the year shows the same prevailing reasons for electrification which were emphasized last year, namely, to increase capacity, to improve service and to promote general economy. Long tunnels, mountain grades and the congestion of city terminals are underlying causes in the United States.

Up to date there have been installations of electrical operation on nineteen railroads in this country. The total mileage operated by electricity is about 1,800 miles of line and about 4,000 miles of track. Of all the roads concerned, this is about 2.5 per cent of the miles of line and 3.0 per cent of the miles of track. For the whole United States it is about 0.7 per cent of the miles of line. For comparison with the United States, there are in the world about 100 railroads with electrified sections in operation or under construction, distributed through 35 countries in all continents.

Of the nineteen roads, twelve are engaged in suburban and terminal operation around large cities. Seven operate over heavy grades and through long tunnels. Most of the terminal roads also have one or two tunnels ranging from a few hundred up to several thousand feet in length, the tunnels of the Pennsylvania Railroad under the Hudson River at New York being considerably longer than any of the others. The curvature on the terminal roads is only moderate.

The mountain roads have 89 tunnels, aggregating 327,000 ft. This is equivalent to an average of 3,700 ft. per tunnel, or 47,000 ft. of tunnel per road. The grades likewise are long and steep with ruling gradient as high as 2.2 per cent. The average ruling grade is 1.5 per cent for an average distance of more than 46,000 ft. In general, the curvature on ruling grade begins near the upper limit of the terminal roads and runs up as high as 12 deg.

Equipment and Power

Of the nineteen roads, three operate passenger service only with electric power, four operate freight service only and twelve operate both passenger and freight service. The statistics for locomotives and motor cars are for the largest equipment on each road. Passenger locomotives are more nearly uniform in size than the freight locomotives and the horsepower varies from 1,000 to 4,000. The heaviest passenger engines are on the Great Northern Railway with a weight of 715,000 lb. Freight engines vary widely on account of some roads having only switching and way-freight service. The freight locomotives for trunk-line service range from 262,000 lb. up to 1,282,000 lb. and from 1,300 hp. to 7,000 hp. The heaviest locomotives are those of the Virginian, which are larger than any others in existence, either steam or electric.

Motor cars vary considerably in weight and seating capacity. The weight varies from 62,000 lb. to 176,000 lb. When used with trailers they are motored at 400 hp. to 1,000 hp, and without trailers at 240 hp. to 470 hp. About two-thirds of the roads use trailers with their motor cars.

Power

The electric power used by seventeen of the nineteen roads in 1927 amounted to 1,585,000,000 kw.-hr. The generated power is slightly more in quantity than the purchased power, but there are more roads purchasing power than generating it. Twelve of the United States roads purchase all their power, while five generate all their power. The remaining two purchase about one-third of their power and generate the rest.

The energy used for passenger-train service varies about the same as in the city and interurban railway service, between 1½ kw.-hr. and 7 kw.-hr. per car-mile. The power used in freight service was reported by six of the railroads. These results vary from 25 kw.-hr. to 100 kw.-hr. per 1,000 gross ton-mile, indicative of considerable difference in the service performed by the roads and the character of the country through which they operate. Five of the roads have locomotives equipped for regenerative braking, but only two report the proportion of regenerated power as respectively 9 and 16 per cent of the total.

Extend Rural Service to 21,217 Farms

By CHARLES F. STUART
Chairman Rural Electric Service Committee

IT IS probable that no year in history has witnessed such significant developments in the application of electricity to agriculture as the year just closed. Farmers, farm organizations, agricultural colleges, the electrical industry, manufacturers of electrical equipment, manufacturers of farm machinery, governmental departments, all have been stepping harmoniously forward, overcoming obstacles, developing new facts, interchanging and spreading information, enlisting new recruits, building farm lines and putting electric power to work at more and more tasks on an ever-increasing number of farms.

During the year more and more electric light and power companies have organized themselves to undertake intelligently the extension of their service into agricultural territory. The year marked an increase of 60 per cent in the number of companies having either rural electric service departments or men especially trained in this particular field, and there is prospect of an even more material development in this line in the year to come.

No attempt was made to count the number of additional farms connected in 1927, as this work has now been included in the periodical electrical census taken by the Bureau of the Census, Department of Commerce. It is significant, however, that in four states, where electric utility organizations made such a count it is found that electric light and power company service was extended to 21,217 additional farms.

FARM LOAD GOOD BUSINESS

Information received pertaining to organization, development and operation of rural electric service departments by several companies indicates that farm business properly undertaken can be made mutually satisfactory to farmer and power company. These departments prove by their own experience that in this supposedly most discouraging of fields an acceptable load in many instances can be and has been developed to the mutual satisfaction of both parties to the transaction. This has been accomplished by intelligent load building, by which is meant the application of electricity to agricultural tasks in such a way as to promote energy consumption and at the same time cut labor costs and increase farm production.

One of the biggest problems still remaining is that of acquainting the farmers themselves with the possibilities of electricity on the farm. Times have been far from prosperous for many of them. They have been too busy scratching a living out of the soil to keep pace with the rapid progress being made in the application of electricity to agriculture. To millions of them the vision of electricity on the farm is confined largely to a more acceptable type of illumination. They do not know that nearly 200 different services on the farm can be performed by intelligent employment of electricity. It is only within the last few years that definite information has been available, and as a consequence it often is found that in a given rural community only one-third of the farmers are alive to the progress which has been made and the relief from drudgery made possible by modern day application of electricity. It is also true that some utility organizations have not kept pace.

This problem of acquainting farmers with the modern-day idea of electricity on the farm is not discouraging at all. It merely means that such communities are not yet ready for electric service, but that as neighboring communities, more familiar with the situation, put electricity to liberal use on the farm, these more backward communities soon will profit by the example set.

RURAL ELECTRIC SERVICE DEPARTMENTS

Only a few years ago the establishment by an electric light and power company of a rural electric service department was regarded as a very formidable and hazardous proposition—something of an adventure, to be undertaken, if at all, only after grave consideration and mature deliberation. That day, however, is past. Pioneers in the application of electricity to agriculture have blazed a conspicuous trail, marked by definite and specific information, and it is the prediction of this committee that within a comparatively few years every electric company occupying considerable rural territory will have a rural electric service department.

Creation of such a department is no longer an adventure, no longer difficult or hazardous. In fact, it is now regarded as the one logical and sensible way to meet the demand of agriculture for electricity on the farm.

The plan of procedure, once regarded as calling for much preliminary consideration, now is simple. The executive head of the company selects an individual, perhaps one already on the payroll, to take charge of this work. This selection, of course, requires some judgment, as the person picked should not only know the electric business, but also something of farming, and he should be what is termed sympathetic with agriculture. If he is not thoroughly up to date on the progress which has been made these last few years in putting electricity to work on the farm, he can speedily remedy that, for a wealth of specific information regarding electric farming in all sections of the country now is available to him.

Next there should be devised a rate. This should be no more difficult than devising a rate for any other class of business. The tendency among companies which have progressed in this field is for the company to finance all or a considerable part of the cost of building the line. In so far as the rate itself is concerned, the thought of principal importance is that it should be a form of rate which will encourage liberal consumption.

The next move is for a survey of the agricultural areas included in the company territory, taking into consideration the different types of farming, density of population, existence of present lines available for farm service, natural geographic boundaries, etc.

There is nothing very difficult, hazardous or intricate about any phase of this procedure. It is merely approaching farm service in a common-sense way, the same as electric companies have approached other classes of business. It is the only means by which requests for farm service can be met intelligently, and it is the only means by which the rural load can be built intelligently.

**Abstract of report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

N.E.L.A. Answers

Propaganda Charges

The fifty-first convention of the National Electric Light Association issued the following official statement:

THE NATIONAL ELECTRIC LIGHT ASSOCIATION has long believed that the success of the electrical industry in the performance of its public functions has been and must be based upon public confidence in its integrity, in its motives and in the character of its achievements. The association has believed, further, that that confidence could be based only upon knowledge and maintained only by a willingness on the part of the industry that the public should have the fullest details of the manner in which it operates.

The American people of today are electrically minded. In the space of less than half a century this nation has reached a state of advancement where the electrical industry furnishes and the nation usefully employs nearly as much electrical energy as the rest of the world combined.

As electric science has advanced the problems and business of the industry have grown greatly. This progress has been so rapid, one development crowding so fast upon another, that it would be difficult without adequate information for general public understanding to keep abreast of the advance.

Recognizing that lack of knowledge is as unfair to the public as it is harmful to the industry, the electric utilities consider it their responsibility to place all the facts before the public.

It is for these reasons that the Nationa Electric Light Association, among its other important functions in the development of the electrical industry, some years ago assumed the responsibility and adopted the policy of preparing and diffusing as widely as possible full, accurate and timely information on all phases of the business.

In this effort the association has encouraged the use of all proper channels for the diffusion of information concerning the industry and has made the facts available to newspapers, magazines, educational institutions and to teachers in public schools.

The truth of the statement, not the place where it is put, is the test. Full responsibility, openly avowed, for every word and act is desirable. All members of the association should scrutinize everything they say and do in the light of these principles, and to the extent which public investigation or public criticism of what we have done may aid in disclosing improprieties, should welcome it. We do not wish to be judged either by intemperate criticism or by our own declarations. We are ready to be judged by our accomplishments and our acts.

The National Electric Light Association in the interest of the public and its own will continue to make available to the public the facts on the progress and development of the industry, and to review from time to time the information distributed, in order that every assertion of fact, policy or principle shall conform to the highest standards of accuracy.

Service the Answer*

Economic and social aspects of the electrical industry reviewed. Federal control unnecessary. Holding company benefits

By MELVIN A. TRAYLOR
President First National Bank, Chicago

THE fact which most deeply impresses the layman is that the entire emphasis in the electric industry has been upon the objective of greater service to the public. In no activity more than the electric utility has the significance and spirit of the descriptive phrase "public service industry" been more fully exemplified. Better service has been the constant aim—service which is more reliable, more satisfactory and more adequate, and which is adapted to ever and more new uses. And better service has been translated by the leaders of your business into terms of constantly greater service to an ever larger proportion of our population, always with a constantly decreasing customer charge.

M. A. Traylor

It is impossible, it seems to me, to exaggerate the significance of the rôle played in our modern twentieth century civilization by electricity and, therefore, by those engaged in its production and distribution. It is probably safe to assert that during the past quarter century no force has been more influential in furthering social progress and human well-being. It has lessened the irksomeness of the laborer's toil; it has reduced the drudgery and routine work in the home; it has lifted many of the burdens of the housewife and lightened those that remain; it has lengthened and made immeasurably more satisfactory our hours available both for work and recreation; it has improved transportation and promoted a better diffusion of our urban populations. Rural electrification programs, such as have been sponsored by many electric companies, have done much for rural life. The electric switch has replaced the coal oil lamp, an instrument of historic service, as well as of smoke and of danger. The farmer now shaves as his wife churns by the same current, while the children project the latest movie in the front parlor—another institution of blessed memory.

And most significant of all, electricity has been harnessed to the machines of our industrial age and has added tremendously to the productive power and efficiency both of capital and labor. Indeed, we are led to conclude that the electrical industry has been one of the most potent forces in elevating the standards of life, or convenience and of comfort for the rank and file of our entire population.

Your industry has demonstrated to other industries the fundamental truth that enlarged and improved service is entirely compatible with sound business considerations. The great social service rendered by you has proved entirely consistent with your own business motives. Your product and sole stock in trade is service, and experience has demonstrated that the less costly and the more dependable your service the more diffused and intensive has become public demand for it. With that increased and better distributed demand have come better load factors, greater production, diminished costs of production per unit, reduced rates, larger sales of service and larger financial returns. Many other businesses in the United States could well profit through the lesson taught by the electric industry in pointing the way to increased prosperity through improved service.

Passing now to more specific problems and tendencies in the electric utility field, there are several which seem to me of peculiar significance.

A NEW CONCEPT OF REGULATION PREVAILS

Originally, the controlling motive leading to regulation of utilities by public authorities was to protect the consumer and to secure for him low rates. Indeed, this was undoubtedly the "prime mover" (to borrow a technical term from the electric industry) in originally instituting public utility regulation. Perhaps we should not criticise

**Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

public officials for this, for there was on both sides in the earlier days a lack of perception of the real identity of interests between the community and the utilities which serve it.

But now it is becoming increasingly apparent to regulatory authorities, to city councils, state commissions and the courts, and even to the people in general, that rates must not only be not too high but also not too low. The public has come to recognize that otherwise not only will new capital be secured with difficulty and at greater cost, but that even existing service and facilities cannot be maintained. Regulation of rates is conceded by all to be necessary, but it is now becoming more widely recognized that they must be fair to all parties concerned—fair to users, fair to the owning companies and fair to the army of investors they represent. It is becoming more and more clearly recognized that if rates are too high an undue burden is placed on the users, and also that if rates are too low all parties suffer. For the inevitable result of regulation which is drastic or confiscatory is to divert investment capital to other channels, thereby making it difficult or impossible for the utility to provide the additional plant, equipment and facilities which are necessary to keep pace with the ever-increasing public demands for service.

This changed conception of the proper objectives of regulation has been due, in considerable measure, to the emphasis that has been placed by leaders in the industry and in the National Electric Light Association, through its public policy committee, upon better public relations, upon education of the public and upon the development of an attitude of mutual understanding.

Rates must not only be not too high but also not too low.

Regulation by state commissions has fully justified itself.

Interconnection has decidedly lessened the significance of political boundaries.

Much good for the electric industry has been accomplished by the holding company.

Statistics show that propaganda for municipal ownership has not had any considerable effect in recent years.

By way of parenthesis, I would like to remark that in my judgment we should recognize that the movement for regulation by state commissions has fully justified itself. Despite the lack of experience of some commissions in the early days and despite the fact that in a comparatively few instances the decisions of these bodies have not been entirely acceptable to those in the business, they have done much to further this newer concept of regulation. And I know of no form of governmental machinery or administrative device which is likely in the long run to prove more effective from the public standpoint, or more intelligent and fair, from the standpoint of the industry. It would, therefore, seem to be of the utmost importance that management should co-operate wholeheartedly and effectively with these bodies. That this association and its members have done so is happily apparent from the cordial relations which obtain between its members and the regulatory bodies.

The development of interconnection and long-distance transmission has been one of the most amazing technological achievements of the century. Its story is a commonplace to you all. A fact which occurs to me in this connection and which I hope is realized by most of our people is that interconnection and long-distance transmission have decidedly lessened the significance of political boundaries—of municipal and state boundary lines. There are many who feel that some character of governmental machinery must be adapted to meet the new situation.

Already the demand is being advanced, from certain quarters, that federal control is now necessary. It seems not improbable that the industry will have to recognize the inevitability of one of these three alternatives: (1) Regional control of some sort through regional boards; (2) regional co-operation in regulation upon the part of existing state bodies, or (3) some sort of federal regulation such as that exercised through the Interstate Commerce Commission.

The latter alternative would seem most unfortunate and undesirable. The Interstate Commerce Commission is already overburdened and the establishment of still another national bureau or commission would be necessitated. This would involve an extension of the tendency toward overcentralization of control in Washington, which has already been carried too far. This tendency toward centralization at the expense of the powers of the states is contrary to the fundamental principles of our dual system of government. But entirely aside from considerations of political policy or principles, federal control would seem unnecessary, as the problem involved is not truly national in scope. Rather, it is a regional problem. For example, the power situation in the Chicago area is not of concern solely to Chicago or to Illinois. On the other hand, neither is it a problem of national scope. It is a problem concerning Indiana, Illinois and Wisconsin for the most part, i.e., a regional problem.

It seems to me that either of the first two methods of control might prove sound—either some sort of regional board, formed by the joint action of the states, or perhaps preferably a program of co-operation between existing state commissions. Either plan might be effectuated through the use of the so-called "compact clause" of the constitution, which permits states, under federal authorization, to co-operate in the solution of regional problems of this sort. The compact clause has been utilized, for example, by New York and New Jersey in the joint control of New York harbor.

The same factor, i.e., the lessening importance of municipal boundaries, due to interconnection and long-distance transmission, will, I believe, defeat the home rule agitation, at least as it applies to the electric light and power industry.

Much good for the electric industry has been accomplished in recent years by the so-called holding company, but just here let me say that it seems to me peculiarly unfortunate that the term "holding company" should have been coined because, as a matter of fact, the holding company as we know it in the utility field differs little save in name from the more modern investment company or investment trust, the holding company being substantially a public utility investment corporation, with

assets consisting of the stocks of utility operating companies.

By means of these companies it has been made possible to secure better and less costly financing, higher caliber managerial supervision, economies in purchasing, better engineering methods, and general reduction in overhead cost. To enumerate all the advantages of a holding company, or more properly the public utility investment company, would require more time than is available to me on this occasion, but no discussion of this subject would be fair which did not acknowledge the very obvious fact that except for these large holding or investment corporations, no such developments as have been recently witnessed would have been possible.

Through their ownership of widely scattered yet contiguous properties, they have been able to bring order out of confusion, harmony out of discord, and success out of failure, and the best of these achievements lies in the fact that they have benefited most those who are in the greatest need of such service—not the companies themselves, nor those who own their securities, but those who live in small towns, rural communities and, chief of all, those living on the farm.

A problem of major importance is properly to work out a balance between regulation and management.

I firmly believe that the electric industry will continue to be characterized by policies of fairness, open publicity and frankness, co-operation with public authorities and, above all, by scrupulously living up to all the implications of its position as a public service industry.

Nevertheless, on every hand we hear proposals for the regulation of holding company activities. It is charged by the critics that holding companies are often subterfuges for avoiding regulation; that they are to a great extent merely "milking companies" to collect undue fees by means of special contracts with operating companies; that they indulge in undesirable financial manipulation and excessive pyramiding to the detriment of public utility credit. Thus far nothing concrete has come of these criticisms; no fraud on the investing public has been proved. None of a serious character probably exists. If here and there mistakes have been made, the advocates of sane policies and sound practices within the industry, and they are in the vast majority, are best prepared to handle the situation and should be allowed to do so.

It would seem that the regulation of operating companies by the various states through their commissions should suffice. Such regulation should meet the requirements of the situation, for the public is interested primarily only in local rates and in local service. Holding companies, as such, are of no more concern to the utility public or to the consumer than is any private investment organization.

I am convinced that holding companies need fear no serious attempt at regulation of their activities, so long as those activities bring benefit, or at least bring no detriment to the conditions of local service and local rates. So long as holding companies place no undue burdens on local companies, there is no adequate cause for regulation. However, if it should happen that any considerable number of holding companies should unreasonably divert earnings of local companies, exact excessive charges for various services, or inflict losses on investors and thereby impair public utility credit through an unsound and excessive amount of pyramiding, then extensive regulation on the holding company could be only temporarily postponed.

An analogous situation is to be found in the development of security issue regulation. At first, there was little attempt at regulation of security issues. Rates and service were the points of chief concern. But the belief, in some cases justified, that financial practices of certain companies not always engaged in the production of light and power as regards securities were adversely affecting rates and service, led to the extensive regulation of security issues which now prevails. Holding company regulation, if it should come, may conceivably be traced to similar circumstances. Agitation frequently concerns imaginary ills. But it is to be remembered that actual regulation is seldom instituted, or maintained, without some justification from the public point of view.

However, I am firmly convinced that such legislation will result only if those directing the development of the holding company movement put in effect unsound policies which in the long run will injure local operating companies, and thereby afford cause for public discontent. The sins of a few companies may be visited upon the entire group, once public indignation is aroused. I confidently believe that this result will be prevented by wise leadership within the industry itself. The best preventive for excessive government control is wholesome control from within. Certainly government regulation in this field is undesirable if it can be avoided. For in the field of management and investment—which constitute the chief functions of the holding, or public utility investment company—the highest degree of flexibility and elasticity is necessary. Regulatory "red tape" would inevitably prove a hindrance.

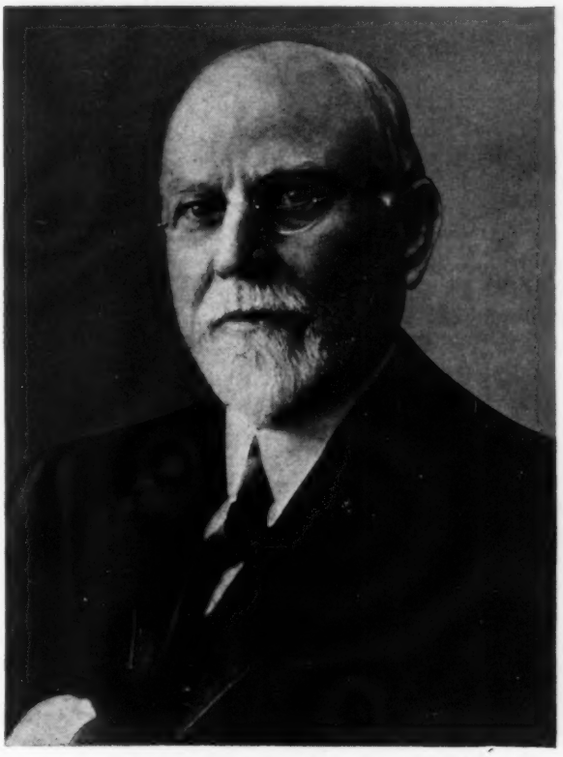
Faith in the Future

In general industry prosperity, the electric industry has participated, for its well-being is inextricably intertwined with that of the communities which it serves. Indeed, due to its rapid advances in technique and operating efficiency, it has been enabled, more than most industries, to maintain earnings while at the same time decreasing the price charged for its product.

I firmly believe that the electric industry will continue to be characterized by policies of fairness, open publicity and frankness, co-operation with public authorities, and above all by scrupulously living up to all the implications of its position as a public service industry, perfecting its machinery for self-regulation and control from within. If this proves to be the case, there is every reason to expect that it may confidently look forward to an era of still further development, expansion, and satisfactory earnings. Likewise, with such an attitude of straight forward policy prevailing throughout the industry, there is every reason to expect that regulation will prove to be neither confiscatory nor excessive, not encroaching unduly upon management, nor upon the incentives of private ownership and enterprise. Thus, it is to be hoped that the electric industry, while insuring fair prices to consumers and fair returns to investors, may become an even greater instrument for promoting social progress, economic betterment, and human welfare.

The Power Industry in the Marketplace*

By James H. McGraw
President McGraw-Hill Publishing Company, Inc.



James H. McGraw

MUCH has been said and written about the need for more energetic methods of market development in the power industry. This is generally admitted. There is no point in my expanding this statement. But it happens also that it does not rest within the control of the power industry to delay action in this matter. For conditions are changing in the marketplace and the power company, that up to now has borne a charmed life because of the natural popularity of its production, is beginning to face and feel the opposition of an aggressive and resourceful competition.

I refer to the growing organized intercompetition between industries that is coming to be called the "new competition." And I submit to you that in future the sale of electrical energy and electrical equipment in the American market is going to depend less upon whether or not people should use the service. It will depend more upon whether or not they elect to spend those dollars for electricity or for something else which at the moment may have greater appeal.

For this new competition is itself engendering a new general philosophy of selection. It is teaching the public to discriminate—not necessarily as to what may be best, but what is most desirable. And just as we have come to learn that we cannot buy all the magazines on the news-stand, so America is beginning to realize that it must plan its purchasing more carefully because selection is becoming more difficult and because of the more deliberate process of modern easy payment buying.

The prevailing question today has become whether to apply available money to something electrical or to an automobile, a radio, a phonograph, a camera, furniture, clothing, shrubbery, or a more extended vacation. This mental attitude, as you know, as not been the outcome of accident. It is the result of ingenious and highly organized sales activity.

Indifference to Electricity

At the present time in the neighborhood of 108 industries are engaged in concerted programs of co-operative promotion for the purpose of strengthening their positions in the marketplace, by securing the attention and developing the interests of the public. Almost every item of the family budget is now subject to the influence of these campaigns and they are effecting some remarkable changes in the relative sales of different groups of manufacturers. The walnut furniture manufacturers, the copper and brass producers, the paint manufacturers, the laundries, the florists, the icemen and all the rest of them are appealing and arguing for a larger share of that universal lodestone, the consumer's dollar.

And while this is all happening, gent'emen, while the American public is lending its ear to these ably presented messages of personal interest and is reacting to the influence of these suggestions, what does it hear and what does it care about electric service? To put it bluntly, if I may, while so many of these other branches of industry have been so actively and cleverly holding the attention of the people, the electrical industry has stood, not mute in the marketplace, but it has not made itself interesting. And when it has talked it has talked too often about itself.

Men and women are busy with their own affairs and they have not been bothering their heads about electricity all these years. The romance of our great industrial development, its spectacular financial expansion, the perfection of its tremendous networks and the magic of its ceaseless service, thrill and inspire us. But to the man on the street it is not nearly as wonderful and astonishing as radio or the motor car. To electrical men the present refinement of electric service, reaching well nigh every hamlet throughout this broad land and making available so many new contributions for labor saving, convenience and economy, is a dominating thought in life. But other men and women are far more consciously affected by the moving picture and by modern plumbing. This fact, I think, the power industry has failed to appreciate and analyze and to reckon with.

**Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

It is precisely to this point that I desire to direct your attention—to the point that it is a new kind of a market that we are facing today in the power industry. It is a highly competitive market and a market competitive not so much between manufacturers as between appeals. Success in such a market is very dependent upon three simple elemental factors: First, the quality of the product offered; second, its presentation and, third, both in place and importance, I think, its price. I would like to comment upon the position of electricity in the new marketplace from these three aspects.

As to quality, our case is clear and strong. There is no acceptable substitute for electric service in most of its common applications. Humanity admits its marvelous power and admires even when it does not adopt. The dependability and perfection of the physical service provided by the modern central station is completely satisfying. Quality, then, we may say, is unquestioned.

In the presentation of its product, however, I think that the electrical industry stands at a disadvantage today. And I have not forgotten that the power companies spent $10,000,000 for advertising in 1926, according to the last available report of your committee on advertising. But let us examine into this expenditure.

That year the power industry enjoyed a total revenue of $1,652,000,000. It therefore appropriated about six-tenths of 1 per cent of its gross income for the purpose of telling its story to the public. However, $3,700,000 of that expenditure was for good-will advertising, $1,000,000 was for supporting the sale of securities, $4,300,000 went to advertise appliances and the remaining $1,000,000 was devoted to promoting electric service of all kinds. Does it occur to you that only the last two items are of any particular influence in the marketplace?

What you say to the public about appliances and about lighting or power or some other form of service applies directly to the industry's sales problem and registers in the new competition. But the advertising of securities, while entirely constructive and desirable, is a matter of financing and a matter of general good will. It does not directly sell either service or equipment. And good-will advertising, while desirable in reasonable proportion, does not close sales, although it creates favorable sentiment. Therefore, 47 per cent of the power industry's advertising was directed to general purposes and only 53 per cent of the advertising expenditure was directly contributed to increasing the public interest in the actual things we have to sell and are urging them to buy. Our advertising appropriation to support our salesmen in the marketplace, therefore, figured about three-tenths of 1 per cent.

What Others Spend

But other industries that sell the popular market have learned that an adequate presentation costs more than this. Three cigarette manufacturers, for example, together spent $54,000,000 in advertising last year. And to compare percentages, one leading manufacturer of motor cars spent 3 per cent, a leading soap firm 2 per cent, a large paint manufacturer 3½ per cent. And so it goes. The contrast is striking.

Of course, the popular advertising of electrical manufacturers is a further contribution to the telling of the story of electricity, but this does not bulk large enough to upset the argument. A glance at the comparatively small weight of popular advertising that is advocating anything electrical amidst the pressure of promotion devoted to other appeals gives impressive proof that we are not making our voice heard in the marketplace. Moreover, the power industry cannot and should not depend on the manufacturer to popularize electric service. His first responsibility is to sell equipment. The central station must do its share of the market building and that share should be a generous one.

I would say, then, that the power industry is spending entirely too little money for advertising to make a strong presentation of its product. Instead of the $5,000,000 or so which your committee says was spent in the newspapers for this purpose last year, I believe the appropriation should be not less than 1 per cent of the industry's gross income. If it were 2 or 3 per cent for the whole industry, it would still be less than the three cigarette manufacturers spent last year.

I would say also that the power industry is spending entirely too large a proportion of its advertising appropriation for indirect appeal. I believe that in the past the executives of the electric power companies have made the very common error of inclining toward the kind of advertising that interests them and their friends instead of the kind that concerns the general public. Utility good will advertising appeals to the electrical man. It can be made extremely valuable in interpreting the policies of the company and its service to the community. But by and large, the average citizen is far more interested in an advertisement that tells him about something that he wants or could use.

Strength of Direct Appeal

As a general rule advertising that increases a man's interest and confidence in the use of electricity will build more good will than an advertisement designed to increase his interest and confidence in the utility company. He buys light or power or industrial heat. His wife can use a clothes washer or a refrigerator. They do not contemplate buying a power company. And they naturally assume and expect that electric service will be good and that the company will grow and deal fairly with the public. The very large proportion of good-will advertising—for much of the security advertising has a good-will purpose—I believe, is a direct reflection of the fact that the power industry has permitted itself to get into a defensive attitude in the relationship which it sustains with the public.

We forget sometimes that the strength of the automobile industry lies in the popularity of the motor car, not in the virtuous reputation of the automobile manufacturers. Automobile advertising talks not about companies but about cars. Electrical advertising, in my opinion, has its greatest sales and good-will value when it talks specifically about electric service in terms of definite uses and not about the central station. If you like your car you have no complaint against its manufacturer. If electric service has become a matter of your daily life and tied up with the habits of your home and the practice of your store or factory, you are well sold on the value of the power company to you.

The Right to Sell

There is a case in point, I believe, in the current criticism of the public utility associations for their expenditures in the presentation of their arguments against the proposed entry of the federal government into the power business. It lies not in the size of these appropriations. For in relation to the capital invested or the total revenues represented, they were not large. They seem small

when we consider the menace of such political privateering upon the public service and the danger to the savings of the millions of investors involved, should such false economic doctrine prevail. But public attention is arrested by the fact that this money was spent for defense and the man in the street asks, Why?

Ten times that amount could have been spent in constructive advertising without comment. For America is accustomed to huge expenditures for market building. Men marvel at the amounts appropriated to advertise motor cars and talking machines, chewing gum and silk stockings. But they never question the business judgment of these manufacturers. The policy has proved itself sound before our eyes.

I believe that once this idea is made clear in this industry there will be no objection or opposition on the part of the regulatory commissions to large, properly balanced advertising expenditures by public utilities. I suggest that it would be well to analyze the comparative expenditures of this and other industries for market development, and to establish with the utility commissions the economic soundness of spending money courageously to increase the volume of sales per customer in order to make reduced rates possible. No one questions the right of a Wrigley or a Ford to advertise to this purpose. Why is it less sensible to promote aggressively this other merchandise? Every business has an inherent right to sell.

Luxury Now the Vogue

Again in the matter of the price of electricity, I have the feeling that as an industry we lack confidence and courage in our own values. Power companies have too often adopted a defensive policy on rates. But there is nothing wrong with the cost of electricity. The price is not too high. It stands alone in its record decline among all the costs of living. Electric service is worth more than it costs today, reckoned against comparable services or commodities. And I believe that the present tendency among the power companies is to reduce rates too rapidly, forgetting that the whole psychology of America today inclines toward luxuries and is indifferent to the economy appeal.

I wonder if we are not making a mistake in talking too much to the public about the utility of electric service. As a matter of salesmanship, is not its luxury its most attractive feature to the rich and to the humble home alike? Review the outstanding examples of spectacular success in the popular market and it is striking that most of these products that have become the vogue in America and established themselves in modern life lie in the luxury class. Automobiles, travel, moving pictures, phonographs, radio, cameras, tiled baths, silk stockings, perfumes, cosmetics, safety razors, candy and cigarettes have all come into universal popularity through the luxury appeal. This experience cannot be ignored by electrical men. "Give us the luxuries of life and we will dispense with the necessaries," said a humorous philosopher, with a keen insight into human nature.

Price Courage

It is the practice in the American marketplace to advertise in order to increase sales and effect a larger production that will reduce the cost and make possible a lower price, which in turn will stimulate more sales. The power industry, in my opinion, has pursued a policy of reducing rates without sufficient provision for the development of the market. A rate reduction may save a million dollars in a year to the people of a city, but after the announcement is forgotten the small decrease in the monthly bill goes practically unnoticed. If that million dollars were to be expended in that single year in local newspaper display advertising, supported by such direct mail, billboard and other attention-compelling methods of display as might be effective, can any one possibly doubt that electric service would win far more popularity and probably enough additional load to provide for the same decrease in rates without reducing revenues?

After all, rates are not such an intricate scientific affair. We need not fear them. The rate is just the price of a commodity that must be sold in competition in the marketplace. It must cover production, cost and overhead and yet facilitate the selling. For this reason the so-called inducement or promotional type of rate gains steadily in acceptance in the industry. It encourages larger sales to the individual customer. And that has been a profitable feature in prices always. For the price of a piece of merchandise cannot be fashioned for the convenience and gratification of the seller alone. The prime requisite is that it should encourage the customer to buy.

The industry needs rates that will help extend the more complete use of electric service by every consumer, but the power company must have price courage and not give away in premature rate reductions the millions that should be spent in the development of the market. For it is more in the public interest that the comforts and economies of electricity be brought into universal use and made less expensive by the consequent increased production than that it be cheapened by price cutting before adequate money has been spent to build the market. So it is with us.

Man Power for Sales

It is into this kind of an arena of large-scale merchandising that the power industry is now entering. And given the quality and given the presentation and given the price, there is one other essential without which success cannot be expected. And that is man-power. Fortunately the power industry is already well supplied in sales personnel. It has in recent years recruited an able staff of commercial-minded men who are eager to go forward. When the executive interest and backing and the financial appropriations needed for the larger operations are provided there need be no question of the capacity of the industry to play its part in the marketplace.

For the development of the popular market, the selling of a complete use of electric service in the homes of all the people one other resource is vital. There is need for the upbuilding of a strong and prosperous independent retail trade in every community. The power industry cannot sell merchandise in adequate volume unaided. It needs a broad skirmish line of active dealers at every neighborhood center of household supply, each contributing his share to the growing load. It needs an army of contractors at work installing adequate wiring that the use of everything electrical may be made natural and easy. The encouragement and guidance of this independent trade to a progressive co-ordination will need leadership, sound policies and unselfish patience. And this will be forthcoming.

I have an abiding confidence and an increasing enthusiasm for the power industry. It has grown great in a service that has won the plaudits of the world. It has triumphed in invention, in engineering, in finance and in administration. It brings to the new problems of this oncoming commercial era resources that will carry over all obstructions. It will not fail to win new honors in the marketplace.

Water-Power Development*

By Paul A. Schoellkopf
Chairman Water-Power Development Committee

Paul A. Schoellkopf

THERE has been no outstanding development in either the theory or utilization of water power during the year, although some progress has been made in both lines.

The efficiency of hydraulic turbines has been improved to the point where it seems there is little room for betterment. As in the design of electric generators, the efficiency is now so high that a nearer approach to 100 per cent can scarcely be expected. Improvement in details has resulted in reaction turbines being placed in service during the year showing an efficiency of 94 per cent over a considerable range. Perhaps the most promising field for water-wheel improvement at present lies along the lines of greater efficiencies in low-head wheels with higher speeds and corresponding lower costs.

There is much interest among hydraulic engineers at the present time over tests on the experimental Stevenson Creek Dam in California and also on the use of small-scale models in hydraulic studies.

Federal Power Commission's Report

During the year the Federal Power Commission issued nine preliminary permits involving 419,407 hp. primary capacity and an estimated installed capacity of 772,800 hp. Eighteen major licenses were issued involving 85,571 hp. of primary capacity and 574,880 hp. of ultimate installed capacity. Twenty-two minor licenses or licenses for minor parts of complete projects were issued involving 43,553 hp. primary capacity and 80,928 hp. of ultimate installed capacity.

Eleven projects were completed or put in operation during the year with an aggregate installed capacity of 217,694 hp. The principal among these were:

	Horsepower
San Joaquin Lt. & Pr. Corp. (Calif.)	42,200
Louisville Hydro-Electric Co. (Ky.)	108,000
North Western Pr. & Lt. Co. (Washington)	16,500
Inland Pr. & Lt. Co. (Idaho)	10,880
Chelan Electric Co. (Washington)	33,000

Thirty-one new projects having an installed capacity, when completed, of 362,000 hp. have been started during the fiscal year ended June 30, 1927, bringing the total of projects completed or under construction at the close of the year to 128 with a proposed ultimate installation of 4,610,000 hp.

Some Power Developments in 1927

An unusual hydro development is the Rocky River plant of the Connecticut Light & Power Company in Connecticut, where electrically driven pumps are being installed to use off-peak power to pump water into a high level storage reservoir. This practice is common in Europe but this is its first large scale use in the United States.

At the Buck's Creek plant of the Feather River Power Company a foreign made banded penstock has been installed operating at a static head of 2,561 ft. Seventy thousand horsepower will be developed in two impulse turbines. This is the highest head plant in the United States.

The largest power development now under construction is the Conowingo Dam and power house on the Susquehanna River, being built by the Susquehanna Power Company, a subsidiary of the Philadelphia Electric Company. A total of 378,000 hp. in seven 54,000-hp. units is to be installed under the present contract and provision is being made for four more units of the same capacity. The first units were started early in 1928.

Developed Water Power in the United States

The United States Geological Survey reports that on Jan. 1, 1928, the developed water power in the United States in plants of 100 hp. or more was 12,296,000 hp., showing an increase of 575,000 hp., or 4.9 per cent, during 1927. The figures for recent years are as given in the following table:

Date	Horsepower	Increase Per Cent
1921 November	7,926,958	...
1924 March	9,086,958	14.6 (2.3 yr.)
1925 March	10,037,655	10.5
1926 Jan. 1	11,176,596	11.3 (0.8 yr.)
1927 Jan. 1	11,720,938	4.9
1928 Jan. 1	12,296,000	4.9

The distribution of this capacity among the states is as follows:

**Abstract of report presented before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

State	Horsepower	Per Cent of U. S. Total
1. California	1,992,000	16.2
2. New York	1,786,000	14.5
3. Washington	702,000	5.7
4. Alabama	652,000	5.3
5. North Carolina	640,000	5.2
6. South Carolina	579,000	4.7
7. Maine	541,000	4.4
8. Wisconsin	480,000	3.9
9. Georgia	469,000	3.8
10. Michigan	381,000	3.1
All others	4,074,000	33.2
Total	12,296,000	100.0

From 1922 to 1925 inclusive the average annual increase in installed capacity in hydro-electric plants was 9 per cent. In 1926 and 1927 it was 4.9 per cent. While the period is too short to make these figures conclusive in themselves, they correspond so well with the known conditions that it seems safe to say that we are facing a slowing up in hydro-electric development. Two factors are principally responsible:

1. The remarkable reductions in steam power costs in the past five years have made many water-power projects economically unattractive today that looked attractive five years ago.

2. Political controversies and restrictive state laws have for the present prevented developing most of the larger and more feasible water power projects.

The United States Geological Survey estimates the total developed and undeveloped water powers of the United States available 50 per cent of the time at 59,000,000 hp., corresponding to about 80,000,000 hp. installed capacity. The 12,296,000 hp. installed corresponds, therefore, to 9,600,000 hp. available 50 per cent of the time and leaves 49,400,000 hp. still undeveloped.

Of this amount the following are held up by political controversies, international negotiations or restrictive state laws:

	Horsepower
1. Various rivers in Maine	630,000
2. St. Lawrence River	812,000
3. Niagara River	2,437,000
4. Potomac River	360,000
5. Cumberland River	126,000
6. Tennessee River	2,000,000
7. Colorado River	5,767,000
Total	12,132,000

It should be noted that the figures in the above list are taken from the United States Geological Survey inventory and represent all the power that it is physically possible to develop. For various reasons it is quite unlikely that all this power can be developed on the Niagara and Colorado Rivers.

Many Developments Not Now Possible

The following large water powers have been studied in recent years and while some of them can be developed at low cost they have been found, with certain possible partial exceptions, to be unfeasible under present economic conditions:

	Horsepower
1. Monongahela River	218,000
2. Red River	115,000
3. Missouri River	2,800,000
4. Flathead River	877,000
5. Columbia River	7,977,000
6. Snake River	5,612,000
7. Deschutes River	734,000
Total	18,333,000

Of the remaining 18,935,000 hp. probably less than 30 per cent, or 6,000,000 hp., can profitably be developed under present conditions.

To sum up, an analysis of the United States Geological Survey inventory of the 59,000,000 hp. available in the United States shows that 9,600,000 hp., or 16 per cent, is developed, 6,000,000 hp., or 10 per cent, will probably be developed in the near future, 12,000,000 hp., or 20 per cent, which probably is economically feasible is being held up by political controversies or restrictive state laws, and the balance, 31,400,000 hp., or 54 per cent, probably cannot be profitably developed under present economic conditions.

The results of this analysis check fairly well with figures given by Major Glen E. Edgerton, chief engineer of the Federal Water Power Commission, in an address before the Mid-West Power Conference Feb. 15, 1928.

A summary of Major Edgerton's figures is:

	Horsepower
1. Total water power in U. S. (50 per cent of time)	55,000,000
2. Corresponding installed capacity	75,000,000
3. Probably 75 per cent of this is under federal jurisdiction.	
4. Installed capacity Jan. 1, 1928, about	12,000,000
5. Licensed by Federal Water Power Commission, but not constructed	4,000,000
6. Under preliminary permit from F.W.P.C.	5,500,000
7. Applications not acted upon	15,000,000

Item 5 includes several projects with construction periods of fifteen years or more.

The casualties in preliminary permits up to date have been so heavy that it would be conservative to assume that not more than 75 per cent of item 6, or 4,125,000 hp., will be found feasible.

Item 7 includes projects on the St. Lawrence, Tennessee, Colorado, etc., held up by political controversy and amounting to about 12,000,000 hp.; the balance of the 15,000,000 probably is not feasible.

If it be assumed that the undeveloped water powers not under federal jurisdiction have the same relative probability of development as those under federal jurisdiction and that the ratio of power available 50 per cent of the time to installed capacity is 55 to 75, the following may be deduced from Major Edgerton's figures:

	Horsepower	Per Cent
1. Total water power in U. S. available 50 per cent of time	55,000,000	100
2. Total developed water power, January, 1928	8,800,000	16
3. Development probable in next ten to fifteen years	5,900,000	10.7
4. Development probably feasible if political controversies be adjusted	11,000,000	20
5. Probably not now economically feasible	29,300,000	53.3

Until developed, water power produces nothing; when developed it continues to produce indefinitely, not being depleted by use, as are most other resources. The importance of developing the water powers that are feasible of development needs no argument. In fact, for the past twenty years the importance and value of water power resources have been so extravagantly urged upon the public by conservation enthusiasts, government operation advocates and others that no sane and reasonable policy of dealing with the development of water power has been able to exist for long. In June, 1920, after twelve years' discussion in Congress, the federal water power act was passed. In spite of its proved adequacy to protect the public interest under all conditions, whatever else may be said of it, it has been subject to annually increasing attacks until it has become, temporarily at least,

inoperative with respect to many of the larger and more feasible power prospects.

The following is a statement of electric energy developed in the United States by hydraulic plants 1921 to 1927 inclusive:

Year	Kw.-Hr.	Per Cent Increase
1920	16,150,000,000	...
1921	14,970,000,000	—7.3
1922	17,207,000,000	15.0
1923	19,343,000,000	12.4
1924	19,969,000,000	3.2
1925	22,356,000,000	12.0
1926	26,189,000,000	17.1
1927	29,875,000,000	14.0

It will be noted that the increase in kilowatt-hour output does not correspond directly with the increase in installed capacities heretofore given. This is due principally to the variation in rainfall from year to year.

The average kilowatt capacity during 1927 of the hydro plants reporting to the Geological Survey was approximately 6,970,000. The average kilowatt capacity during the same period for the fuel burning plants reporting was about 19,580,000. The following table shows the average capacity factor at which the hydro and steam stations operated in 1927:

	Capacity Kw.	Output, 1927 Kw.-Hr.	Equiv. Continuous Kw.	Capacity Factor
Hydro stations	6,970,000	29,875,000,000	3,410,388	48.9
Steam stations	19,580,000	50,330,000,000	5,745,434	29.3

There has been no water-power legislation enacted by Congress so far this session. Several bills for the disposition of the government property at Muscle Shoals have been introduced. In the meantime, the government plant at Muscle Shoals is being operated by the War Department, and the power is being sold under a revocable contract to the Alabama Power Company.

The Swing-Johnson bill providing for the construction of the Boulder Canyon dam has again been reported out favorably to both houses of Congress. The principal opposition to this measure has been due to the inability of the seven states in the Colorado Basin to agree upon an interstate compact for the division of the water. Efforts to procure an agreement between the states have been persistent during the past year, but so far without success. Without such agreement the legislation probably cannot pass both houses at this session. In the meantime an understanding of this project seems to be spreading. If the project were really understood by the country at large it would have no chance of being adopted, for it is primarily a project to subsidize political ownership and operation on a scheme that is unsound from both an engineering and an economic point of view.

Bills are again before Congress for both the Umatilla and Columbia Basin projects on the Columbia River, but even their supporters seem to have no expectation of procuring action at this session.

Perhaps the most important federal activity pending relative to water resources is the surveys provided for in the last rivers and harbors act in accordance with the report of April 12, 1926, of the Chief of Engineers and the Federal Power Commission. These surveys were given considerable prominence in connection with the Mississippi flood problem. Many localities are pressing for early completion of them with the expectation that they will, through the plea for local flood control, prove the means of obtaining federal contribution toward local irrigation or power projects that have not been able to get launched on their own merits.

A recent exchange of notes between the United States and Canada indicates that negotiations for carrying out the combined navigation and power project on the St. Lawrence River may be resumed in the near future.

Why the Investment Company*

"CONSTANT demand by the public for improved service and higher quality of production has necessitated concentration of capital in increasing amounts. As the American people are rightly opposed to government or municipal ownership of utilities, this means that these great enterprises, requiring investment of enormous sums, must be made inviting to investors; otherwise they will seek other fields and the utilities will go begging for capital and public support."

This was the keynote of the address of Arthur W. Thompson, president United Gas Improvement Company. He went on to review the evolution of industry, particularly of the utilities, from ownership by a few partners in local companies to control by investment companies and operation under a management system that has proved far more efficient and economical. Public utilities, he said, are being regrouped according to economic interests along defined geographical lines. Hand in hand, there has been proceeding a widening diffusion of stock ownership, the tendency being to divorce ownership from management. There are now 5,500,000 security holders of utilities, as compared with 500,000 about 25 years ago.

"The managers of these large companies," Mr. Thompson said, "are agents for all the stockholders or owners and hold their positions at the will of the stockholders. Their positions can be secure only through honest management, high business ethics and high moral standards, which brings into public service high-class, well-trained professional men.

"The investment company, by reason of its supervision of a large number of properties, is enabled to maintain a staff of technical experts, each skilled in his particular line, whose services always are available to the operating company. Through the investment company the needs of the local operating company, which are increasing rapidly, are financed on favorable terms." The investment company, the speaker asserted, assures the best of engineering. Its accountants subject the operating results of the local company to close monthly analysis, making for strictest economy in operation.

"The function of the investment company is getting more and more to be that of adviser, and the authority to manage and operate is being more and more localized in the hands of the local officers of the company," he said. "The problems from now on will be national rather than local in scope, and public utility executives must begin to think in terms of national problems, realizing that anything one group does affects not only that particular group but the entire industry. The standard of performance must be not whether a given policy is legal but whether it is in the public interest."

**Abstract of address by A. W. Thompson, president United Gas Improvement Company, before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

Industry and Business Schools*

Professional business school result of changed business conditions. Industry co-operation essential to success. Progress of industry constructive

By DEANE W. MALOTT
Harvard School of Business Administration

THE reasons for the rapid growth of schools of business are not obscure. With the dissolution of the army in 1919, men who had been trained in the pursuit of war, recognizing the advantages of specific intensive training, sought entrance to the business school as a preparation for their life work, with the result that twice and three times the expected numbers sought admittance to the schools of business in that year. Then, too, with the growing complexity of the business unit has come the need for trained men to fit into organizations where one man's capital, labor and knowledge are not sufficient, as they once were, to direct the business efforts. The organization has not always functioned well, and even today we have great problems yet unsolved which are calling for all the intellectual power, all the idealism and all the sportsmanship which we are capable of producing.

Deane W. Malott

Hence, business schools have taken a place in the educational scheme of things and give promise of having started on a career of importance to business. Now, what may you men of industry expect from this educational mushroom? We hear rumors, and occasionally see something in print, concerning the new profession of business, and we have come to realize that the world needs sadly this new profession. But the visibility is low, so to speak, and we see obscurely into the meaning of the term. Obviously, there have been many professional men of business, but it is safe to say that business, the profession, is only now emerging. Its problems and tasks, however, have not waited at all. They loom large on the business horizon.

The difference between the old-time business and the emerging profession of business today is the result of the effort to establish guiding principles, underlying fundamentals, recognized by the leaders of industry and trade, as being the guides to navigation in a previously uncharted sea. It is the result of the emergence of ethical standards governing accepted practices and methods of procedure. It is the result of a rising consciousness of the social responsibilities of the business man, along with his business activities. These together are weaving the enduring web of a business tradition, to the pattern of which each leader of industry may contribute the example of his efforts. In the upbuilding of these professional aspects business education must assume a leading part if it is to fulfill its prophecy of service. But the graduate of the business school is no more a full-fledged swivel-chair business executive than is the interne from the medical school a skilled surgeon or the graduate of the law school a seasoned court lawyer. Experience and judgment, a knowledge of the particular technique and the confidence of his fellow-man are important ingredients to be added when he has left the academic halls, and they may require years to attain.

What, then, is the object of the training offered by the schools of business? We are all attempting in the first place to teach men to think. At Harvard we have substituted for the method of teaching by precept the analysis and diagnosis of actual problems collected from business. Our research men are constantly at work seeking from business men data concerning the actual problems which face them. In the discussion of these problems the student arrives at a reasoned judgment, and underlying economic and business principles are brought out where possible. In the course in public utility management, for instance, the problem of regulation is approached from the actual court and commission decisions, and the question of rate determination has as its basis actual problems surrounded by the necessary facts and theories for its determination. The student thus acquires a method of approach of far more importance than the facts themselves, for business is dynamic and facts as

**Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

they exist today will not hold true in the day in which these young men assume their responsibilities in industrial affairs.

But the relation between the schools of business and industry goes far deeper than the training of young men for business life. From you men and from those in other fields must come the teaching material, and the soundness and wisdom of our instruction is in large measure dependent upon your co-operation in allowing us to keep in constant touch with the measured tread of progress in industry and trade. No school of business, if it is really to serve industry, can be a thing apart from business activity. Our research men are constantly in the field, and in the process of obtaining teaching material we are building up for you an ever growing background of economic data which may guide you on your way. And the men of business have been everywhere co-operative and generous of their time and strength, not only in giving us often the intimate details of their problems, but in bringing personally into the classroom their counsel and experience.

They have given financial aid to the development of business research and teaching. Trade associations and individual business concerns and business men have practically supported the research work of the Harvard Business School, which is providing teaching material for more than a hundred other business schools throughout the country. The students can through their tuition pay the instructional costs, but obviously the costly research necessary to provide teaching material in the various fields of business cannot be covered by tuition charges and can come only from the far-visioned leaders in industry who realize the importance for the future of the intellectually trained man.

Business as a profession is just emerging.

The large corporation in its process of development generally tends to elevate itself to higher ethical standards, and there inevitably creeps in more of a feeling of trusteeship, not alone for the security holder, but for the employee and the community as well.

The social responsibility of the business man is inescapable.

Within the last five years public utility instruction has been added to the curriculum of the Harvard Business School. In this audience are many men from concerns which for the last three years have been giving their financial support to the development of public utility management, teaching and research in the Harvard Business School, and you may be interested therefore in a report of progress. This money has been spent to help pay for instruction in a course in public utility management advice concerning which has never been sought from nor given by those contributing to this support; to collect several hundred actual problems, from commission and court decisions and from concerns in the public utility industries—all factual incidents reported for class use and published as a collection of cases—and to produce a detailed and inclusive factual study on "the interstate transmission of electric power," published without comment as a compilation of facts and of specific use to us as teaching material. Wherever material resulting from our studies is of direct and immediate interest to the business world it is made available, and factual studies are published from time to time.

This is not only typical of our relations with other industries, where in several different fields groups of business men are helping us in the furtherance of knowledge and research, but I believe is typical of the sort of effort going on in other professional schools of business. And the support of this industry and of other industries to the professional schools of business has made possible the development of intellectual training for business, the establishment of business principles, and a basis for creating a professional motive in the young men entering business which otherwise would never have been possible.

Ethical Standards Improve

Naturally funds come from the larger units and groups in industry—from those groups where power is often associated with some sinister purpose. The "soulless corporation" is constantly held up as the great example of unethical operations, although seldom is it deserving of this characterization. The large corporation in its process of development generally tends to elevate itself to higher ethical standards, and there inevitably creeps in more of a feeling of trusteeship, not alone for the security holder but for the employee and the community as well. This ethical evolution goes on because through the years a large organization must be reasonably trustworthy in its complex internal operations in order to continue to conduct the business service which is the purpose of its organization. It must, therefore, choose trustworthy men for its organization, and a group of men who so conduct themselves that their associates can trust them will over a period of years be the type of men who are trustworthy in dealing with their public. We are all more sure of an honorable trade with the great national corporation than with the man in the fruit stand at the corner. Moreover, the big corporation generally emphasizes stability and permanence, rather than immediate profits, with the result that its policies are determined for the long run and that more consideration is given to factors of ethical importance than might otherwise be the case.

Business Research Imperative

Moreover, it has long been recognized that sound business practice must rest on firmly established research into the facts and economic principles of business. A concern which operates its own research department is looked upon as outstandingly progressive in bringing to its highest fulfillment the service it offers to the public. It certainly is no less far-visioned to make possible through financial support industrial studies by the schools of business, where adequate research organizations are set up, away from the firing line of conflicting motives and prejudices, and where men are dedicated to the search for truth.

It is also an accepted principle in the development of business to build up public recognition through advertising and to attract the most capable men into the industry. Certainly it is in keeping with this policy to provide ample opportunity for the training of young men in the problems of the industry, in the schools of business.

Young men are challenged by the problems which business offers.

Let there be more and still more co-operation, therefore, between industry and the schools of business, for the opportunities are legion and time is running against us. Two hundred years of adventuring in the realm of science has opened constantly new and larger opportunities for progress and for the culture and comfort of modern civilization.

Owen D. Young, in an address at the dedication of the buildings of the Harvard Business School a year ago, said: "I can see a picture of the adventurers in pure science moving out into unknown fields as the great geographical explorers set sail for unknown lands. Following them are the applied scientists learning how to use the new forces just as the early settlers followed the old adventurers. Finally, business organizes itself to harness these forces and put them to work. Never were opportunities so great as now. Never did unexplored areas seem so vast. Never was there a more responsible trusteeship needed for the discovery of new opportunities or for the administration of existing powers. We need today more than ever before men to administer this trust who are not only highly skilled in the technique of business, men who have not only a broad outlook in history, politics, and economics, but men who have also that moral and religious training which tends to develop character."

Social Responsibility Inescapable

This is a challenge to the combined efforts of schools of business and industry. If it is to be met, we must develop men fundamentally capable of meeting the social responsibilities which business men more and more will have to assume. Religion is fraught with dogmas, political leadership is losing ground, science has created a materialistic world, and on all sides complicated questions of social relationships press for solution, and the leaders to attack these problems are strangely missing. Yet the social responsibility of the business man is inescapable. It involves the job of raising industry itself, from within, up to a higher ethical plane, a plane which is not socialism, nor communism, nor government operation, nor the exercise of the police power, but rather a great development from within the business itself of a sound and effective control of industry, its relations with labor, with its customers and with the public.

The co-operation of business schools and industry is no easy task. It calls for breadth of view, for perspective and for patience. Problems of right and wrong arise with such constant frequency that the need for careful thinking and high standards is especially great. You men in business are constantly dealing with moral issues. The moral strain to which the young man is subjected in entering the ministry, medicine or teaching is far less than in law or business. Material success is a temptation for which we may too readily subordinate the ethical and cultural aspects of life, and this temptation is far greater in business than it is in the other professions.

On the other hand, if one realizes that all types of service which are open to the young man entering the other professions are also open to the young man entering industry, there is a tremendous challenge to maintain youthful idealism and sportsmanship; these will contribute immensely toward the solution of the problems likely to confront civilization during the next few generations.

Utility Women Help*

Should be trained in electrical housekeeping and understand the problems in the homes

By Miss Sophia Malicki
Chairman Women's Committee

TO UTILITY women there appear to be two challenging conditions demanding a personnel thoroughly informed to meet them. These are (1) the lack of public understanding of utility structure and its operation, (2) the lack of knowledge as to what the services of utilities can do for the home. These conditions directed the choice of subjects of the committee program. Throughout the country utility women are studying economics of utilities and application of electricity to the household. Along with this they are preparing for and carrying out plans for diffusing the information to women outside of the industry.

A utility company should be the community household management center. It should answer the plea of housewives for a place to which they can turn for advice and assistance on problems of efficient management of the home. This should also be a laboratory for studying performance of equipment sold by the company and finding new uses for it. All women of a serving company should be as thoroughly trained in electrical housekeeping as possible, and through their knowledge should broaden and follow up the work of the home service members.

All committee units follow the plan of inviting representatives of women's organizations, schools and home makers to the educational meetings and receptions. This acquaintance is valuable to utility women because it brings to them recommendations for serving the customers better. It gives to the visiting women an understanding of the purposes of the organization and of the companies' sincere desire to satisfy their public. It is important that our women understand how to help the home makers of their communities; it is just as important that the home makers know our women can help them. Wives and relatives of utility employees have a large interest in the industry and are enthusiastic participants and contributors to successful committee work.

Problems of the Farmer's Wife

The farm woman's problems are a large concern to utility women. Understanding full well the difficulties interfering with complete farm electrification, they want to bring these explanations to farm women and also to give to them an appreciation of what electricity will do on the farm. In one state the women's committee has arranged an organization including utility women, representatives of the Federation of Home Bureaus, home demonstration agents and members of home economics colleges to study means for the best co-operation between the farm women and those of the electrical industry.

Safety, a subject of universal importance, is followed in all educational and public work. Committees are giving resuscitation and first aid instructions to clubs, schools and young people's organizations. This study of safety practices qualifies committee members to participate in community safety programs. Units of safety councils

**Abstract of report presented at N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

find utility women valuable coworkers because of their understanding of the importance of safety education.

A Form of Social Service

Women's committee units in all localities are taking their proper part in civic and philanthropic activities. The opportunities for participation are many—health campaigns, baby weeks, invalid soldier, orphan and other programs. Public speaking is followed by committee members—not with the thought of intriguing audiences through their eloquence, but to present simply and directly the facts women are requesting. This is recognition of an obligation. Many of you last year heard Mrs. Baldwin. chairman of the living costs committee of the National League of Women Voters, say: "We have many questions which we want to ask you. We want to know the cost of production and distribution; we want to know about the regulation of utilities; we want to know the facts—to understand your problems."

And we should certainly fail in a duty if we did not make ourselves heard in places where improved home making is studied. The fact that women need to place a higher value on their energy and time brings a direct responsibility to the utilities for a liberal portion of education in standards of health and decency. Our services supersede the largest portion of drudgery in housekeeping, and ours the blame if so many women are still doing physically work for which machinery is developed. This is a social problem and ours is a fault chiefly of omission. We have not universally enough competent women to give the assistance to home makers they need.

Women appreciate and respect the responsibility placed on them of spending 80 per cent of the money going into retail trade. They are happy to learn that utilities are making every effort to put brains behind the counter and impart to them more information about what they are buying and using. This educational work is gaining for utility women their recognition by home makers as intelligent representatives of an industry deeply important to home making.

Some N.E.L.A. Serial Reports, 1927-1928

Commercial

Industrial Heating

Carburizing in the Electric Furnace, No. 278-5.

Industrial Electric Heating Installations, No. 278-28.

Sales Plan for Developing Industrial Electric Heating Load for Electric Service Companies, No. 278-13.

Lighting Service

Lighting Service Manual Part II, No. 278-1.

Power Committee

Economic Utilization of Waste Wood, No. 278-18.

Serial Report Power Committee, No. 278-61.

General Merchandising

Trade Practice in Central-Station Merchandising, No. 278-9.

Industrial Lighting

Results of the Industrial Lighting Sales Campaigns, No. 278-19.

Wiring

Sell Additional Wiring, No. 278-35.

Engineering

Overhead Systems

Service Tests of Treated and Untreated Poles, No. 278-3.

Mechanical and Electrical Properties of Conductors for 220-kv. Lines, No. 278-17.

Meter

Standardization of Terminal Chambers for Single-Phase and Polyphase Watt-Hour Meters, No. 278-16.

Auditing Meter Records, No. 278-23.

Educational Opportunities for the Meterman, No. 278-27.

Methods of Determining Correctness of Watt-Hour Meter Connections, No. 278-31.

A Method for Determining the Condition of Current Transformers While in Service, No. 278-40.

Totalizing Output of Two or More A. C. Circuits on One Watt-Hour Meter by Paralleling Secondaries of Current Transformers, No. 278-43.

Hydraulic Power

Waterwheel Testing and Operating Records of Plant Discharge, No. 278-34.

Electrical Apparatus

Automatic and Remotely Controlled Substations, No. 278-6.

Generating Station Bus and Switch Structure Design, No. 278-20.

A.-C. Substation Design Practice —1927, No. 278-39.

Accounting

Purchasing and Storeroom

Standardization and Simplification of Stationery and Office Supplies, No. 278-29.

Linking the Material and Supplies Account on the General Books with the Physical Inventories, No. 278-30.

Statistics

N.E.L.A. Statistics, No. 278-62.

Customers' Records

Receiving, Recording and Refunding Customers' Deposits, No. 278-32.

General Records

Economic Utilization of the Payroll Department, No. 278-54.

Fixed Capital

Fixed Capital Records of Structures and Contract Construction, No. 278-60.

Convention Reports

Educational Committee, No. 278-47.

Rural Electric Service Committee, No. 278-50.

Insurance Committee, No. 278-58.

Public Speaking Committee, No. 278-59.

Lamp Committee, No. 278-63.

Water-Power Development Committee, No. 278-66.

Radio and the Power Industry*

Millions in revenue from alternating-current sets. Use in public relations. Engineering applications. Future uses outlined

By H. P. DAVIS
Chairman Board of Directors, National Broadcasting Company

THE radio industry has grown so fast that few, aside from those directly connected with it, have any idea of the rapidity with which it has developed. In order that we may obtain the correct perspective and thus see the possibilities, I am going to quote a few basic figures which have been gathered from sources which, I believe, are authentic. These data in one way or another have been frequently quoted —my justification in repeating them is the fact that their increasing significance renders them well worthy of repetition and consideration.

The radio industry, directly and indirectly, gives employment to more than 320,000 people, with approximately 30,000 manufacturers, agents and distributors engaged in the manufacture and sale of its products.

H. P. Davis

The sales of radio merchandise in the year 1920, prior to the start of KDKA, were less than two million dollars. Sales have grown from year to year, until in 1927 they were approximately five hundred million dollars. In seven years, therefore, a business in the neighborhood of two billion dollars has been created.

The total number of homes in the United States is approximately 28,000,000; there are about 10,000,000 homes with receiving sets, leaving about 18,000,000 homes without receiving sets. At present 694 broadcasting stations in the United States are entertaining the public, and it is estimated that there are about 40,000,000 broadcast listeners in the United States.

Here, within the range of a single voice, we have a potential audience of 40,000,000 people, and the number is constantly increasing. Such has been the increase in the radio industry in the United States. It has been the most remarkable achievement in the industrial history of the world, and should furnish a sufficient answer, if such is necessary, as to the permanence of radio.

Radio has become an indispensable element of modern life. No new service ever received such immediate response and favorable reaction from the public or was so instantly popularized.

During the past year there has been a wholly revolutionary change in the power supply for radio receiving sets. With the advent of successful alternating-current operated thermionic tubes, the battery filament supply is being rapidly superseded by these alternating-current devices, and the entire energy required for operation of a radio receiver may be obtained from the lighting circuit.

More than one hundred million radio tubes have been sold, and a conservative estimate would indicate that there are fifty million radio tubes now in daily operation, with the possibility that this number will be greatly increased within a short period.

Although at the present time only a part, possibly a third, of these radio tubes derive power directly from the lighting circuit, yet the number will rapidly increase. The receiving sets, of which these tubes are a part, draw current both day and night every day in the year, and it may be conservatively stated that the average requirement of current by each receiver is not less than eight kilowatt-hours per month. In a number of surveys that have been made by power companies and others, to determine the effect of this load, it has been found that the average radio set owner has increased his light bill from 25 per cent to 40 per cent, due wholly to the additional hours he uses the lighting service. This is no mean item of increased revenue available to lighting companies, due to the increase in power consumption by radio listeners.

It is my belief that this is only a beginning of a very considerable and valuable load, the amount of which is readily appreciated from the figures I have given. Furthermore, the number of receiving sets now in use and the possibilities of a great expansion in the number, all of which will eventually be electrified where such a service is available, must result in many millions of dollars

*Abstract of address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.

a year additional revenue to the lighting companies.

The policy of the power companies with respect to the service they will render these radio customers is one that must receive serious and sympathetic consideration.

There remains then the question of how the power company may best utilize and develop radio broadcasting to further its public relations.

It is the key to millions of homes. It takes part in the family life and enjoys the intimacy of the family circle. These features make its employment one of great delicacy and fraught with danger if not handled with the best judgment and tact; for radio comes into the home as a guest and will be welcome or unwelcome exactly under the same rules of behavior as any other guest.

The use and development of radio broadcasting by the public utilities is a contribution they owe to the industry. already several of them have made evident their appreciation of this fact, and three different ways of using this facility are being developed:

First—Broadcasting station ownership and operation.

Second—The use of chain broadcasting station facilities.

Third—Local broadcasting.

From my experience in developing, maintaining and operating broadcasting facilities, I do not recommend the first. The growth of the sponsored program has largely extinguished any value of individual ownership in favor of the sponsored program.

In the case of the large, nationally developed public utilities, network facilities like those provided by the National Broadcasting Company are to be recommended.

For the local utilities, the medium is obviously the local broadcaster.

The offerings in all cases should be of the highest class in the entertainment features, coupled with carefully prepared information.

So much for the present. What does the future hold?

No one, ten years ago, would have envisaged the actualities of today; yet we, who are directly within the industry, I repeat, may presume to predict even better things. While our radio brings us only sound today, in our laboratories sight transmission is an accomplished fact. We call it Television, and it only remains now to reduce it to a practical form to make it available to the public. This will be another appliance one hundred per cent electric.

Talking "Movies" Near

Talking "movies" in the home is also just around the corner. At the start, this device will be actuated through the use of individual film records; later, as a service of the broadcasting station.

Apparatus is now developed in practical form whereby a message or a picture can be transmitted in facsimile form—in other words, as a typewritten page or picture. This is an entirely new and revolutionary system of telegraphic communication.

This agency opens up other avenues whose development can be most far-reaching. I conceive it possible, when combined with the principles of the Televox, to arrange a device for use as a broadcast receiver which can be started or stopped at will. This device will automatically take the message from the broadcasting station in facsimile form—in other words, as a printed communication. At one's leisure, he can go to his receiver and get the market reports, weather reports, important news items—in fact, through selective controls, any service would be available for which he may indicate a desire. Items of interest will be made available in the home or office immediately they occur, and thus furnish the means by which this information may be quickly and easily obtained.

Progress in this direction is inevitable; its future is assured.

The Rate Situation Discussed*

By Edwin Gruhl
Chairman Rate Research Committee

Edwin Gruhl

NOTWITHSTANDING the outstanding success of the electric light and power industry in efficiently serving its public, and especially its achievements in anticipating requirements of its patrons, there has occurred during the past year much discussion in criticism of the industry and its rate policies. Coupled as these criticisms usually are with the belittling of regulation and the advocacy of municipal and government ownership, it is not surprising that the data upon which they are based do not withstand the scrutiny of critical analysis.

The rate research committee has issued reports for many years and therein has pointed out from time to time the policy of the industry toward rates—only, however, in so far as provided by the scope of the committee's activities. At no time has the committee ever expressed any opinion as to the reasonableness or unreasonableness

**Report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

of any rates *per se,* nor is it within its province to do so. It is not within its scope of activity to discuss the merits of private versus government ownership or the questions of policy involved therein. The work of the committee has dealt mainly with rate forms, types, methods of analysis, etc., and in its reports it has endeavored to point out advantages of the most suitable forms of rates which are beneficial both to the customer and the company and to comment on important events in rate matters occurring during the year, such as court and commission decisions, rate papers, results of special research, etc.

The purpose of a price policy in any industry is to develop the maximum of business at a minimum of cost, a result of mutual interest to producer, merchant and customer. As has been pointed out in previous reports, that policy may be expected to vary according to the locality, its domestic and industrial requirements, its cost of providing service, its possibilities of increased development of the use of such service and other factors. But the ideal policy for time and place exists irrespective of the form of regulation or the character of ownership. The extraordinary development of the industry and its ability to reduce prices with such growth in business demonstrate that as a whole its rate policy has been sound.

Much of current criticism has been quite general and is thus difficult to answer specifically. The principal allegation seems to be that the rates in a specified community are too high compared with the rates in other specified localities. This charge, in fact, appears to underlie most of the criticism directed against the industry as a whole. In many cases the rates cited specifically are in error. In others, comparisons of rates are made as between different localities and as between different classes of customers, with no consideration given to the differing conditions and factors which in nearly all cases totally invalidate such comparisons. The usual method of making such a charge takes the form of selecting the lowest rate of a municipal plant as the criterion by which to compare all private-company rates, without any mention of the subsidy which often makes such low rates possible or of the rates of the other municipal plants which are materially higher.

Attempts have also been made to create the general impression that more or less discrimination exists against the residence class in favor of the large power user. It has been claimed that generally the rate schedules are the haphazard results of charging "what the traffic will bear" and that there has been little or no attempt made to adjust rates on a scientific basis.

All of these charges have been widely broadcast throughout the country and have received limited comment in the press in certain sections. Occasion was taken in our last year's report to disclose the error of such comparisons and alleged facts appearing in a similar connection during the then current year. The analysis presented by your committee has not been refuted. Its report has been given wide circulation and is certainly familiar to all careful students of the principles of rate analysis. The continued repetition of erroneous statements under these conditions can be accounted for only as the result of misrepresentation or ignorance.

The report of your committee this year (which will be published later as a serial report) undertakes to disclose, for the benefit of member companies and all students of the rate situation of the industry, additional data and information in refutation of these general charges. While the material does not pretend to completeness, it is sufficiently indicative to demonstrate that many of the charges repeated against the industry constitute unwarranted and misleading propaganda.

Under the heading "Rate Comparisons" there will be found of particular interest comparisons of bills of municipal plants for domestic service with charges of communities served by corporations. These demonstrate that, if such cost comparisons are proper, the customers of a number of widely quoted municipal plants are not as fortunately situated as those served by public utility corporations under private ownership, and that for the group as a whole charges in reality for this class of service, concerning which there has been the most discussion, are lower than those by the municipal undertakings.

The purpose of a price policy in any industry is to develop the maximum of business at a minimum of cost.

It is believed that the industry has met the burden put upon it as a new and growing industry and has not only lowered its charges generally but that the service received by the consumer today is worth many times the value of that which he received but a few years ago.

Two publications, "What Price Electricity in Our Homes," by Morris Llewllyn Cooke, and "Power Control," by Raushenbush and Laidler, have recently appeared. These have been analyzed by the committee and are commented upon in the forthcoming report. Study has also been made of the rate situation in Ontario, looking to the comparative trend of domestic, commercial and power rates, with the analysis disclosing that the classification is not, as frequently alleged, based upon cost of service to the class, but upon other considerations, the most important of which is that of political expediency, the domestic customers being favored at the expense of the commercial business. This is confirmed by the recent report of the commissioners of Toronto, which admits that domestic service in Toronto has been rendered at less than cost and announces increases in domestic rates effective in July.

The report also discloses in reveiw the significant decisions within the last year of courts and commissions, all of which appear to confirm previously established principles. Carl D. Jackson, legal advisor of the association, and John D. Van Wagoner, assistant, have continued their careful work as editors of *Rate Research.*

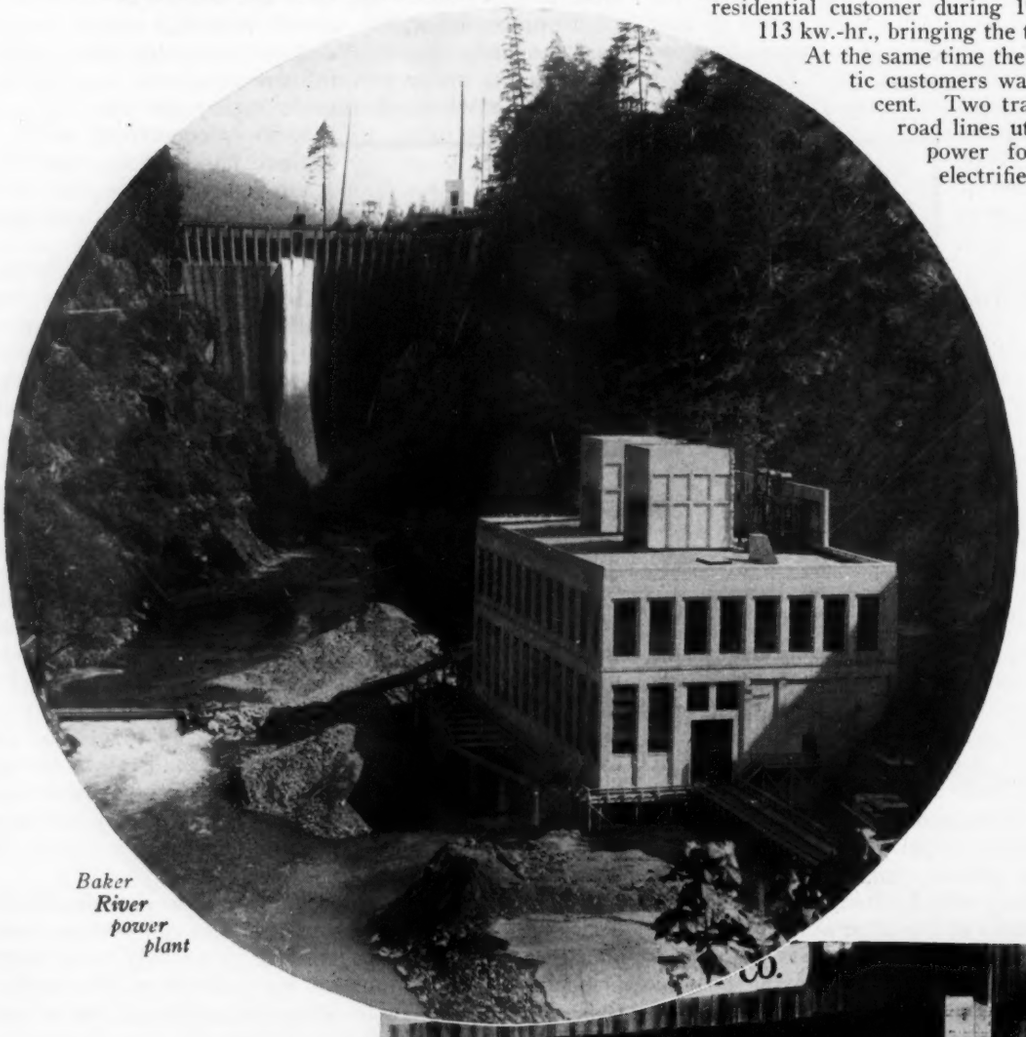
Especially informative will be found the bibliography on classification of service and analysis of costs. It will be seen that the industry has been well aware of these important factors since the earliest days of the central stations. It is believed that the industry has met the burden put upon it as a new and growing industry and has not only lowered its charges generally, but that the service received by the consumer today is worth many times the value of that which he received but a few years ago. The industry has endeavored to render approximate justice in its charges to its different classes of consumers, and, on the whole, it can confidently be asserted that this has been done.

Coffin Award for 1928

GOES TO

Puget Sound Power & Light Company

RURAL development, domestic load building through intensive sales effort and railway electrification are among the outstanding accomplishments that won for the Puget Sound Power & Light Company the 1928 Coffin award. In 1927 the company connected 3,700 farm customers, raising the total to 25,000 (63 per cent of the 40,000 farms). During the year 8,042 electric ranges were sold, establishing a record for the third consecutive year. The total number of range customers at the end of the year was 22,369, or a range to every 4½ residential customers. The average annual consumption per residential customer during 1927 was increased 113 kw.-hr., bringing the total to 763 kw.-hr. At the same time the number of domestic customers was increased 11 per cent. Two transcontinental railroad lines utilize Puget Sound power for operating their electrified sections.



Baker River power plant

Domestic and rural uses of electricity stimulated by appliance displays

Some Puget Sound

Accomplishments

Rural

Added 3,700 rural customers in 1927; serves 25,000 out of 40,000 farms.

Pioneered in electrifying brooders; reduced cost of orchard spraying; improved irrigation.

Virtually all of the $30,000,000 poultry industry in western Washington is electrified and 90 per cent receive service from the Puget Sound Company.

Developed many new farm uses for electricity.

Domestic

Established inducement rates.

Increased average domestic consumption 113 kw.-hr. in 1927.

Average is now 763 kw.-hr. despite 11 per cent increase in customers; average revenue $31.39.

Sold 8,042 electric ranges in 1927.

Total on lines is 22,369, or one for every 4½ domestic customers.

Railroads

Aided electrification of Great Northern and Chicago-Milwaukee Railroads.

Electric pumping that produced 100 bushels of wheat per acre

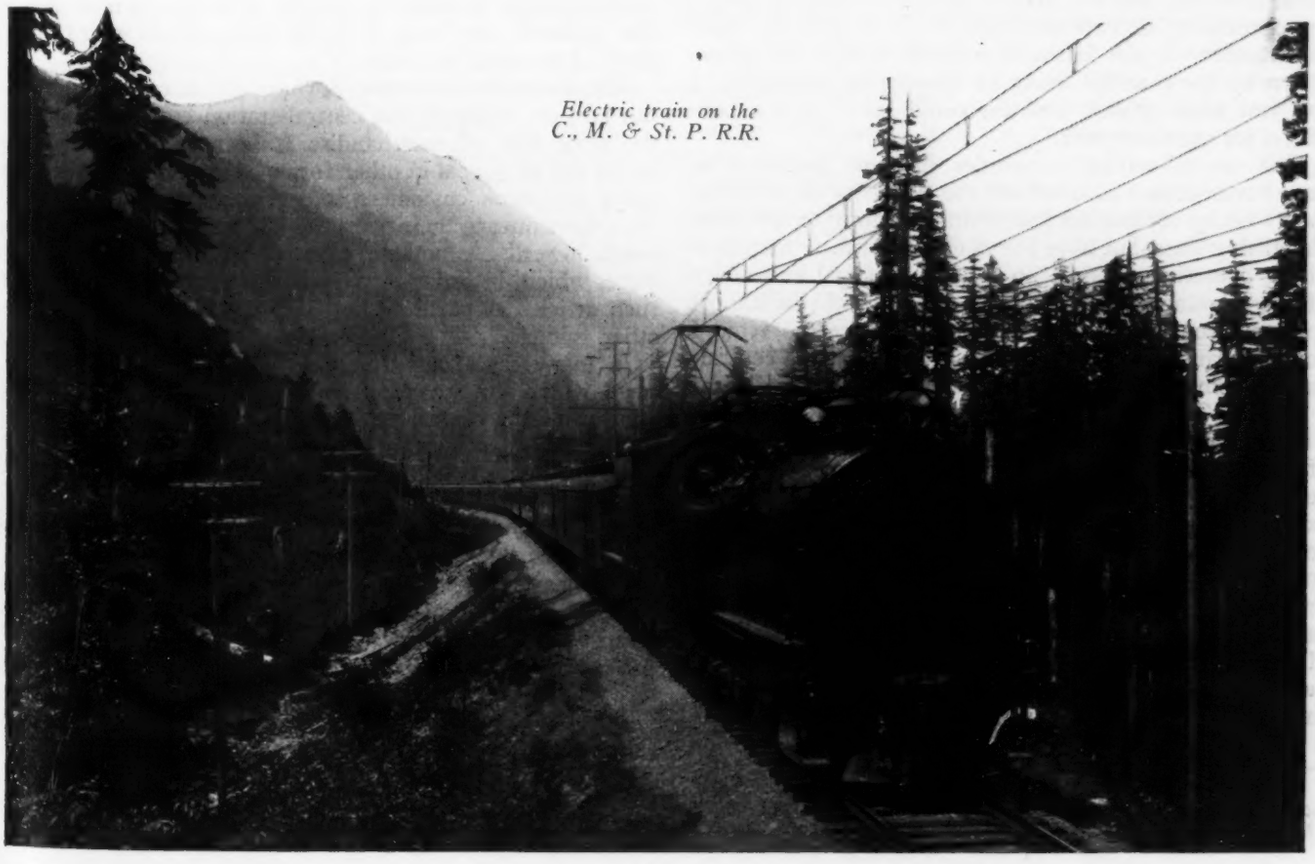
General

Removed serious barrier to hydro development by hoisting fish over 293-ft. dam.

Increased gross revenue 14 per cent in 1927.

Increased domestic revenue 21.3 per cent in 1927.

Raised total domestic consumption 30.2 per cent in 1927.



Electric train on the C., M. & St. P. R.R.

Allocation of Sales Costs*

Merchandise Accounting Inadequate in Utility Business—Classes of Charges and Importance to Sales Efforts

By E. W. LLOYD
Vice-President Commonwealth Edison Company

E. W. Lloyd

VERY few central-station companies were in the merchandising business ten years ago, but recently the number has increased very rapidly, principally owing to the fact that the central-station companies are realizing the necessity of selling more kilowatt-hours to each customer and that the sale of electrical merchandise gives the greatest promise of bringing about this result.

The proper allocation of accounts covering the cost of the important subdivisions of these operations has not had very much consideration. The classification of accounts as it now exists is not sufficiently broad to cover what is required by the merchandising manager or the executive to provide a complete picture of the situation and enable him to know his exact costs. In many instances merchandising accounts have been combined with other accounts, and we frequently find the functions of a merchandising department carried on in part by other departments in the business without control or supervision by the merchandising or commercial manager. I ask you what private business could stand such a condition for even one year.

The central-station companies in most instances to date have seemed to overlook the necessity of selecting men who by inclination and training belong to the merchandising class, but have put in charge of their merchandising operations men of no general practical knowledge of the intracacies of the art of selling, with the almost foregone conclusion that they cannot succeed. Now I do not mean that this is the only reason that the central-station companies have been unable to merchandise at a profit. There are numerous other reasons, some of which I will mention—the lack of customers' acceptance of many electrical devices as a whole; many electrical devices are still in the early development stage of their existence; many of the functions performed by electrical devices can be accomplished by other utensils backed up by years of customer experience. There are still a few articles of merchandise, such as the flatiron, that have common use in the home, but a large majority of devices have not had common acceptance, so we are faced with the resistance of prejudice and unfamiliarity on the part of the ordinary "prospect." Another factor is the long life of ordinary electrical appliances. The customer buys an iron, toaster or percolator and frequently does not need another one for several years. In other words, the narrowness of the electrical line and the infrequent purchases of most devices usually sold in the merchandise shops of utility companies, dealers and other electrical stores are a distinct handicap in the attempt to make money by selling such merchandise without side lines. Without these, those who complain of us could not exist.

The reason the department, chain and hardware stores can and do undersell the central-station companies with the same line of merchandise is because they have a broad line of appeal in other forms of merchandise which bring the same customers into their stores frequently. As a consequence their overhead per unit of sales is very much lower. A notable example is the corner cigar store, which, in order to pay enormous rents, has added such articles as razor blades, lighters, clocks and many other things.

In many cases our stores have been loaded up with costs which do not properly belong against the store division of the central-station activity. Part of the rent costs charged to merchandising activities should be allocated against the electricity sales of the company, because the company in most instances is required to furnish reception and display rooms in which the public can transact the normal business of electricity supply, and at least part of the cost of these rooms should be properly charged against electricity sales rather than against merchandise sales.

HANDICAPS TO PROFIT

Another handicap has been the charges for advertising. The insistent demands of public utility companies from every source for participation in every class of advertising known to trade are well known. The sale of goods by a merchandising company, with the necessity

*Address, "Some Problems for the Accountants in Merchandise and News-Business Expense," before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.

for showing a profit or going into bankruptcy, permits the use of only such advertising media as would bring profits to his business.

Another example of improper charges against merchandise activities has been in connection with that class of merchandise known in one case as experimental and in another as promotional—for instance, any devices using electricity which are strictly in the experimental stage and which, if the central-station company did not promote and push them, would never be developed. We have had many experiences in the past with such appliances. How many ruefully remember the difficulty of selling the early electric iron, the table lamp and the electric fan! The second instance is the promotional form of merchandising, where the device has been developed but has never had very common acceptance—for instance, heating and melting furnaces, commercial cooking and other industrial devices. The cost of persuading customers to use such devices is a way beyond the possible merchandising profit. The cost of selling such devices has no place in merchandising costs as applied to merchandise of common acceptance, such as is usually sold in larger quantities in electrical stores. Another cost which is frequently charged to merchandising effort is putting on a campaign for the sale of a particular kind or class of merchandise which in the last analysis would not be attempted if the company carried on any merchandise sales activities in the usual acceptance of the word—for instance, such campaigns as the placing of kitchen-window ventilating fans, kitchen lighting units, the replacement of old lighting fixtures in the home with new ones, the installation of wiring for more outlets in homes already wired, the development of new electrical devices to place the manufacturer in a position where he can make enough of them twelve months of the year to warrant him making a price the public will pay. We have not at all reached the stage where the manufacture of such devices is possible on a basis of production which will permit the making of a price that will encourage use. At the present time we are trying to encourage the manufacture of electric dish-washing machines, egg beaters, therapeutic devices, hair dryers, massage machines, insulated ovens, etc. It is hardly necessary to enumerate any more of such a line. It would not be difficult to enumerate dozens of them.

What I am leading up to is this, the accountants in our business in developing adequate accounting systems should take into consideration the factors above enumerated; that the charges against simple merchandise that has had some customers' acceptance should be segregated from others entirely promotional or experimental in character; that they should give consideration to the proper allocation of certain costs for rent and other overhead costs which have a distinct relation to the sale of merchandise of common acceptance. Storeroom and transportation costs, rent, advertising, etc., should be scrutinized carefully to determine in what classification such charges belong.

The standard line of household utensils, all of which are on display and sale by the average electrical store and in the electrical section of department, chain and hardware stores—and which, by the way, were only a few years back in the experimental or development stage and scorned by those who are now complaining in some locations of some of our practices have in the last year or two been given considerable attention by half a dozen national organizations representing the department stores, hardware stores, drug stores, furniture stores, etc. Some complaints were being registered against central-station companies for selling goods at a loss. There are many angles to this problem, many of which these associations do not understand. They only know the merchandise referred to in a previous paragraph that has had sufficient customer acceptance to permit them to sell it on a par with other goods they sell at a price which will net them a profit provided the local central-station company does not adopt the practice of price cutting. We should in no event continue a practice of price cutting, but I do not believe the practice is so common as some people think. I believe, on the whole, the central-station industry is maintaining prices of merchandise on a fair basis. Our critics are not themselves free from criticism on this score. We can, particularly in the large cities, refer to the daily advertisements showing cut prices on many lines of electrical merchandise, in many instances much lower than the central-station company can sell them.

In many cases our stores have been loaded up with costs which do not properly belong against the store division of the central-station industry.

I do not believe there is any excuse at this time for central-station companies selling common and accepted lines of electrical merchandise at a loss.

There are thousands of applications of heavy-duty appliances which will never be put in service if the central-station company does not do the pioneering job.

Any executive whose company is selling only 350 kw.-hr. a year per residential customer should be thoroughly ashamed of his position in the industry.

I do not believe there is any excuse at this time for central-station companies selling common lines of electrical merchandise at a loss except in specific cases where the device in question has not had sufficient acceptance to make it a common article of trade and where if the central-station company does not make some effort to place it in that position it will never get there. There are plenty of such articles being developed every year.

I think we should discourage the giving of premiums of various kinds, but I see no reason why we should not follow the accepted practice in the merchandising trade for the disposal of merchandise that does not move quickly. All merchandising concerns recognize this principle. They also look for leaders to attract people to their stores. When merchandise does not move quickly they see to it that it will, by cutting the price. It is standard accepted practice to carry on seasonal sales on a very wide line of goods at prices they advertise as being below the standard prices. Who is not familiar with the January linen, the August fur and the March furniture sales? Now, this suggestion that we cut prices does not mean that we should cut the price of merchandise of standard acceptance, but that we have the right to follow accepted practice in merchandise trade, such merchandise to be legitimately disposed of.

We note that department stores advertise a standard line of goods at cut prices where they are able to buy a job lot of a firm going out of business, to buy from a jobber or manufacturer caught with too much stock or to purchase a bankrupt stock. Why should we not do the same if the goods are right?

There is still another class of merchandise which must be given consideration, and that is the heavy electric appliance used in industry, which is not being promoted or sold by the manufacturers, manufacturers' agents or jobbers in sufficient quantities to make the common use of such devices possible. Some one has predicted that there will be just as much electricity used in the next generation for heat applications in industry as has been used in motors in the past generation. This may or may not be true, but the fact remains that there are thousands of applications of heavy-duty appliances which will never be put in service if the central-station company does not do the job or until such time as there are enough of these devices manufactured or demanded so that others may do the work of selling at a profit.

Another factor is the cost of servicing devices. All electrical devices require more or less service from time to time, and it is natural that the public call on the central-station company for such service, all of which is part of the cost of popularizing the device. Nevertheless, not all of this servicing cost should be charged to merchandising accounts as the central-station company enjoys revenue from the sale of electricity from the device for long periods of time and if the device is not in use the company in question is losing revenue because of this fact.

These are devices in the promotional stage which cannot in the first few years of their development carry a merchandise profit. As a recent example, let us recall the domestic refrigerating machine and in the recent past the washing machine, on which we and the manuafacturers have had to incur large losses in order to put such devices on a strictly merchandise basis. Some of them have not arrived yet. If the central-station companies had not placed themselves behind these and similar devices with money and service at their command, the department and hardware stores would not be able to sell them today. Who ever heard of a case where those now complaining furnished money to perfect any electrical device?

I am sure that if we went out of merchandising neither they nor the public would receive the benefit accruing when science, invention and the manufacturers are encouraged by the central stations, which help in placing in the hands of the public the labor-saving devices that are helping in such a large measure to place the American home on a higher plane and standard of living than ever before attained.

We are just entering an epoch of development of the industry which demands the sale of more kilowatt-hours, and the company whose executive familiarizes himself with the full merchandising problem and backs up his sales manager not only with money but with intelligent teamwork will reap the harvest of more energy sales in full measure.

In most of the cases coming to my attention the sales manager is not getting the assistance needed to do a big job, and it is a big job. Any executive whose company is selling only 350 kw.-hr. a year per residential customer should be thoroughly ashamed of his position in the industry, and he can only change it by intelligent rate structure plus fair merchandising intelligence and a forcefully backed-up sales effort. The accountant must not shirk his duty in this situation.

The Ten Cardinal Rules of Customer Ownership

Prepared by the Customer Ownership Committee
of the National Electric Light Association

1. The sale of the securities must be direct from company to customer or through an agency expressly created for the purpose and controlled by the company.

2. The safety of the securities offered must be amply protected by property and earnings.

3. A minimum rate of dividends must be provided for in so far as honest judgment based on experience can foresee.

4. A reliable resale market must be maintained in some manner so that shareholders who wish to dispose of their holdings can do so promptly at nominal expense.

5. A partial-payment purchase plan must be operative in order to give every customer who can save a small amount monthly full opportunity to become a shareholder, and to encourage thrift.

6. The proprietary interest and responsibility of shareholders must be emphasized and the shareholders supplied regularly with information regarding their company and its affairs.

7. Loss of capital by shareholders in hazardous and fraudulent offerings from various sources must be guarded against by the rendering of authentic information and advice to shareholders.

8. The number of shareholders must be increased steadily, and efforts should be made to avoid large individual accumulations of stock.

9. Employees must be carefully instructed in order that all representations made to customers or others shall be in line with the facts.

10. Managements must realize that customer ownership multiplies their obligations to the public and intensifies the trust reposed in them. It does not replace the constant striving for higher efficiency, good service, reasonable rates, courtesy and progressive public relations policies.

Importance of Accounting*

Complexities of the accountant's work have grown greatly, but the standard of personnel has not kept pace with the increased requirements. Machines in accounting

By E. A. Davis
Chairman Accounting National Section

E. A. Davis

WE ARE passing through an interesting period in the development of this country—probably, from the phases of both government and business, one of the most interesting in the country's history. This is not the time or place to theorize on the tendencies in either phase nor on their possible consequences. One of the byproducts of the governmental phase has been an increased, though temporary, burden thrown upon the accountants of most of the companies. This condition made itself manifest during the past year and in all likelihood will continue well into the next administrative year. Probably no other section of the association is faced with this same condition. It must not be allowed to act as a retardant influence upon the forward movement of this section, and it appears unusually desirable that the work for the year be got under way with dispatch. Those of you present who are responsible for the work of the geographical divisions should bear this in mind and apply yourselves diligently to the task before you. It will be several weeks before the new organization for the national section can be perfected and functioning. In many of the geographic divisions a great deal can be accomplished before that time, and to you present who will be carrying on the work in such divisions I bespeak for the new administration earnest co-operation in this direction.

As a means of assisting the new administration in getting the committee work under way with the minimum of delay I obtained from each of the national committee chairmen a review of the year's work of his committee, together with his recommendations as to next year's procedure. Interesting among the comments received was a statement calling attention to the tendency of the committees to ease off on their work in the early months of the calendar year. This is no doubt due to the habits of old continuing, habits created under the old plan of publishing all committee reports for distribution at the annual convention with a dead line for the receipt of copy set at approximately March 1. That condition no longer exists. Reports may be printed at any time under the present plan, and there is no reason for a committee's activities not continuing up to the time the annual convention assembles.

We dwell quite extensively in our meetings and in our reports upon accounting problems and procedure and very little, if at all, upon the personnel problem as it is found in the average accounting department. Those of us whose experience covers no more than fifteen years have seen the complexities of the work being done in this department increase tremendously. Pension plans, savings plans, federal taxes, incentive wage scales, transmission lines are but a few of the contributory causes and do not take into account problems occasioned by rapid growth. In addition, we have seen the requirements of the other departments and of the executives become much more exacting in the character and quality of the information provided by the accounting department. Justifiably so. Despite all this, I seriously question if the average personnel standard has been raised to any marked degree. The reason for this is probably not difficult to discover. It is unfortunately true that too frequently economy waves pound hardest on the accountants and their departments. But the accountant who practices economy to the extent of depriving himself of the right kind of assistants and timber for promoting through succession is likely to prove extravagant.

Furthermore, the complexities and the decidedly specialized nature of the accounting work in this industry make it more essential than in any other industry that there shall be competent assistants developing in the accounting departments. As a rule the responsibility for their selec-

**Abstract of report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

H. C. Hasbrouck
Chairman Committee
on Classification of Accounts

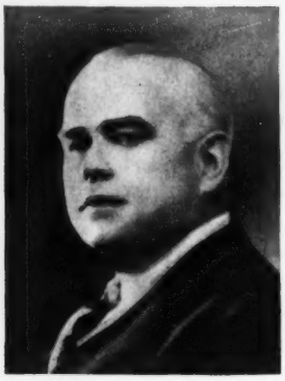
J. E. Loiseau
Chairman Committee
on Corporate Finance

B. F. McGuire
Chairman Committee
on Customers' Records

M. R. Scharff
Chairman Committee
on Fixed Capital

F. J. Brett
Chairman Committee
on General Records

R. G. Smith
Chairman Committee
on Statistics



W. G. Young
Chairman Committee
on Purchasing and Storeroom

tion rests upon the accountants and it is not a responsibility that should be taken lightly.

It is entirely within the realm of possibilities that business conditions of tomorrow will require more than heretofore company executives whose basic training has been along economic lines. Careful selection of assistants today might provide the needed executives of tomorrow. A carefully selected personnel is but the beginning, however. Their subsequent training and development is of equal importance and is a serious responsibility of the accountants. As an aid in this development I do not believe it is necessary for me to point out to this gathering the practical advantages afforded by permitting active participation of the assistants in the work of this section.

Machines in Accounting

That we are living in a machine age is just as true of offices as it is of factories or of homes. The opportunity for doing more work and better work by the use of mechanical devices exists in the offices as it does elsewhere. The reports of the Accounting Section have not up to the present time dealt extensively with the application of such devices. The types available are many and various. None of them is made to meet the requirements of public utility offices exclusively. Some of them are better adapted for one class of work while others will excel in another class. The amount of information available as to the types of devices best adapted to the various accounting operations in a public utility office is meager and, as a rule, the product and concept of the manufacturer. Certain difficulties have heretofore existed which have tended to discourage any attempts by committees of this section to issue reports dealing primarly with these mechanical office devices. It is believed that the way has been paved this year for the removal of these difficulties so that the Accounting Section can by means of committee reports or some other manner make available to the member companies authentic information on such office equipment—information derived from its practical operation in public utility offices.

Progress on Standardized Accounting*

By H. C. Hasbrouck

THERE are 39 regulatory commissions having jurisdiction over the accounting practices of electric light and power companies, including 38 state bodies and the commission of the District of Columbia. Twenty-eight of the 39 have adopted the standard classification recommended by the National Association of Railroad and Utilities Commissioners and formally adopted by the National Electric Light Association. The accountants of four other state commissions are now giving serious consideration to the adoption of the standard classification.

The standard form of annual report has been less generally adopted, principally, it would appear, because the state commissions require more statistical data than the standard form of report contains.

**Abstract of report of committee on classification of accounts, presented at N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

Decisions on questions of interpretation which have been passed upon by the committee in prior years are on file at National Electric Light Association headquarters, but still await editing for publication. This task, we hope, will be completed by the work of next year's committee.

The committee has gone definitely on record as believing that no changes in the standard classification should be recommended this year, but this does not prevent it from giving consideration to certain modifications which have been suggested and which undoubtedly merit discussion. Some of these it has before it at the present time, but it is not prepared to make definite recommendations thereon.

Among other matters for which this must be offered as in the nature of a progress report are the co-operation with the Commercial Section in an effort to obtain a uniform system of merchandise and jobbing accounting, which at present awaits the initiative of the Commercial Section, and the study of the accounting problems involved in interconnection agreements. This last subject was referred to the committee by resolution of the executive committee of the Accounting Section last February. It has been laid before all members of the committee, but evidently requires careful consideration, in view of its importance and comparative novelty. It can probably be best handled in a serial report by next year's committee.

Railway Electrification*

Illinois Central electrification described. Why power was purchased. Future of electrification outlined. Interrelation of the railroad and utility industries

By L. A. Downs
President Illinois Central Railroad

IN CARRYING out the electrification project in a manner to provide for the inevitable future growth of Illinois Central freight, passenger and suburban business at Chicago and assure the maximum efficiency in terminal operations, the Illinois Central is practically reconstructing its entire Chicago terminal. The electrification itself is being undertaken by stages. First is the electrification of the suburban service; that stage was completed in August, 1926, six months ahead of the time agreed upon. Next will come the electrification of freight operations, and later the electrification of through passenger operation.

When the electrification is completed it will cover 420 miles of freight, passenger and suburban tracks. In addition to the electrification itself, the whole Chicago terminal improvement project includes: Elimination of both highway and railway grade crossings on the main line for a distance of 38 miles south of the Chicago River; relocation of nearly all tracks in the Chicago terminal area; the movement of approximately ten million cubic yards of earth; construction of an immense gravity freight classification yard on the outskirts of the city; construction of extensive shop facilities; relocation and construction of freight and passenger car yards; construction of bridges, tunnels and subways; erection and reconstruction of suburban stations and platforms; erection of a through passenger terminal at the south end of Grant Park; construction of 250 miles of new trackage; construction of several miles of retaining walls and the reconstruction of the signal and interlocking system.

Some of these improvements were not essential to the electrification and could have been deferred until later,

L. A. Downs

but it would have been more difficult and costlier to carry them out after electrification. The elevation and depression of tracks for the elimination of grade crossings, for example, was far more economical under steam operation than it would have been after the overhead

*Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.

supports were erected and transmission wires were in place on fixed bridges. A permanent track plan was worked out which will reduce to the minimum the possibility of having to shift tracks after electrification.

The electric suburban service covers a zone embracing 37.8 route miles and 127 miles of trackage. In the electrification of this service it was necessary to erect more than 900 catenary structures and to string approximately 293 miles of transmission wires and and 470 miles of messenger and contact wires. The 1,500-volt direct-current system with overhead contacts is used.

The electric service was begun with new equipment throughout. The cars, specially designed for this service, are of all-metal vestibule construction, each having a seating capacity of eighty-four. Spaciousness, cleanliness, good ventilation, uniform heating and ample lighting are among their notable features. The trains are operated in multiple units of two cars—a motor car and a trailer semi-permanently connected—and four-car and six-car trains are most numerous, although station facilities have been designed to accommodate eight and ten-car trains where required. At present 260 cars, having an aggregate seating capacity of approximately 22,000 persons at one time, are in use, and these cars are carrying approximately 120,000 passengers every weekday.

Aside from equipment, the most important factor entering into the electrification of the suburban service of the Illinois Central System was the choice of power supply. The practicability of constructing an independent power system, including generating plants, transmission lines and substations, for the sole use of the railroad was carefully considered, but the decision was against doing so and in favor of purchasing all electrical energy, under contract, from the Commonwealth Edison Company. Under this arrangement the Commonwealth Edison Company erected its own substations at designated points on the right-of-way, and it now supplies direct current to the traction system and alternating current, of suitable characteristics, for signal, light and other auxiliary uses.

Reasons for Plan

I believe you will be interested in an outline of the reasons which led us to adopt this plan. The erection of an independent power system would have involved a heavy investment on the part of the Illinois Central, and the high cost of generation in such a plant, by reason of the necessity for a relatively high percentage of reserve generating capacity and on account of the comparatively small peak-load demand, would have made the operation inherently less economical than the purchase of energy from a large and highly organized power system. Furthermore, the ownership and operation of such a plant would have carried the railroad out of its sphere into the highly specialized field of power production, a field in which it might have been difficult for the railroad to keep itself up to date. Moreover, uninterrupted service must be maintained. Any breakdown of electric supply in such a busy terminal would be highly disastrous. The purchase of energy from a large power system having an ample generating reserve and duplicate transmission lines assures the Illinois Central of a dependable, uninterrupted supply of energy.

In its physical characteristics the electric suburban service represents a vast improvement over the steam service which it replaced. The widespread public approval that has been given this service is evidenced by the fact that the present volume of suburban patronage is already more than one-third greater than immediately prior to electrification in 1926. The increase in patronage has been so much greater than was anticipated that we have already found it necessary to place orders for twenty additional cars for early delivery. Because the running time of trains has been reduced between 11 and 28 per cent, electrification has increased the desirability of outlying communities by bringing them all within closer reach of the central business district.

I have already referred to the fact that under steam operation the Illinois Central suburban service was an unprofitable enterprise. It not only was failing to pay a return upon the investment in suburban facilities and equipment but the revenues were not sufficient to meet out-of-pocket expenses. By reason of the greater economy of operation and the increased patronage which followed electrification, in addition to an increase in rates which shortly preceded it, these out-of-pocket losses have been entirely wiped out, and the service is now producing considerably more than enough revenue to pay operating expenses and taxes. Although the present net income is still substantially short of a fair return on merely the outright cost of the suburban electrification itself, including the $10,000,000 worth of equipment purchased, there is ground for hope that with the continued growth of patronage the time will eventually come when the suburban service will be fully self-supporting, including a moderate return upon the whole investment.

One of the potential byproducts of railway electrification in the larger cities is the development of air rights. The development of such rights at New York demonstrates the possibilities in this direction at Chicago. The Illinois Central owns 65 acres of valuable property adjacent to the Loop business district in Chicago which will be available for air rights development as a result of the electrification of the terminal. It will be many years before these air rights can be fully developed, but they will be of large importance in estimating the eventual results of electrification.

Because of the prominence of our electrification program—the publicity it has received and the discussion it has caused—I am often asked for an opinion concerning the future of railway electrification. I am not given to prophecies, but I think there is no doubt that utilization of electric energy will continue to increase as special problems in railway capacity and operation are encountered.

Influences Upon Electrification

As I see it, there are two elements which will have important influences upon the future development of railway electrification. The first of these is the development in the art of applying electricity to the problems of railway operation. Thus far it can hardly be said that railway electrification has passed out of the experimental stage. It has not been standardized to the extent of steam railway design. Each project that is undertaken is a new experiment in that it deals with a special problem, all phases of which have not been developed heretofore. I regard our own electrification as such a project. I have faith that the results we shall finally accomplish will fully compensate us for the expense we incurred, but when costly undertakings are being considered without the necessity which forced the Illinois Central into its electrification program it takes more than faith to justify the large expenditure involved. Engineers must know in advance that the results will be sufficient to pay a full return upon the investment, and they must be

able to marshal the facts to support that knowledge.

If you are desirous of hastening the utilization of electricity in the solution of railway problems, there is scarcely any service you can render of greater importance than that which looks toward the development and standardization of the art of producing electrical energy and its application to steam railway operation. I do not mean that all types of electrification should be alike, for there are many problems, but I do mean that the art shall be reduced to such generally applicable terms that a railway engineer can know that under certain definite conditions certain definite results will be produced.

The other important element influencing the future development of railway electrification is the financial element. After it is proved that money can be saved by spending money for electrification, there is still the problem of where to get the money to spend. Every railroad in the country has plans for large engineering projects of demonstrable money-saving value that must be deferred from year to year because the money is not readily available with which to carry them through.

Here, too, but in another way, you can make a real contribution not only to the progress of railway electrification but also to the continued improvement of railway service and the increased economy of railway operation.

A simple illustration will show the results of the constant pressure for reduced rates. On the Illinois Central System our average revenue for hauling a ton of freight one mile was reduced from 9.66 mills in 1921 to 8.86 mills in 1927. Now, this reduction of eight-tenths of 1 mill per ton mile may seem to be a small item, but when it is applied to the 16⅓ billion ton-miles of revenue freight handled by the Illinois Central System last year, it amounts to more than $13,000,000, and $13,000,000 is 6 per cent on approximately $216,000,000. I am not going to say that this missing $216,000,000 worth of potential investment would have been made in electrification if we had had it at our command, but you can see for yourselves how much better disposed toward electrification a railroad with $216,000,000 extra of investment power would be than a railroad that lacked such an amount.

The constant downward adjustment of rates threatens to undermine railway credit. Credit is dependent upon adequate rates. If the railroads are to improve their properties and increase the capacity of their plants in keeping with the ever-increasing demands which are being made upon them, they must be allowed to earn returns that will attract the needed capital.

The electrical industries and the railroads have much in common. Both are engaged in providing for the masses of our population services of the most essential nature which have contributed greatly to the effectiveness of human endeavor. Both face large and important problems arising out of their common necessity for increased production, greater economy and equitable regulation. Finally, the buyer-and-seller relationship between them has grown to large proportions as the railroads have come to make greater use of electricity for light and power and the expanding electrical industries have made greater use of the transportation service which is the product of railway operation.

Both industries have felt the blighting effect of misguided public opinion in the past. Both have been the targets for hostile legislation and restrictive legislation. Both have consciously and earnestly sought to improve their relations with the public. There is no question in my mind that a great deal has been accomplished in this direction in the last decade. This accomplishment is reflected in the friendly attitude that now prevails generally in the public mind toward these industries and in the increased tendency on the part of law-making and regulating bodies to give them both a square deal.

I have been impressed by the excellent work which the National Electrical Light Association and the various electrical companies have been doing in recent years toward bringing about a better public understanding of their problems. There is no question that the whole electrical industry has been vastly benefited by this work. I believe it has had a beneficial effect upon corporations generally. On the other hand, the efforts of the railroads along similar lines have probably benefited your industry in like manner. Such efforts are cumulative in their effect. Their full benefits will not be felt for years to come. It takes time to efface the long-standing prejudices of the past and to bring the public mind, long given to mistrust of corporations, into a sympathetic understanding of their problems.

Confidence and co-operation cannot be built on any other basis than that of mutual understanding, and such understanding can be obtained only with the constant interchange of trustworthy information and intelligent discussion. The public is fair when it knows the facts and understands them. To me it is unthinkable that the frank, open, straightforward course which has increasingly marked the conduct of business affairs in recent years shall be abandoned.

Lighting Service Committee Work*

By J. Daniels, *Chairman*

IT IS now recognized that the central-station lighting service department has its own peculiarities which are not shared by other branches of the industry. It has, therefore, been found desirable to hold closed meetings from which all manufacturers' representatives are excluded. The merits of various equipment or methods of lighting practice may then be freely discussed without offense to outside interests. Such meetings are naturally designed to further the central station's interests, but have incidentally benefited the entire industry by calling the attention of manufacturers or outside interests to any practice considered commendable or otherwise.

It must always be borne in mind that the central-station engineer is concerned first and last with the effect upon the ultimate consumer. Each customer looks to him for an expert and unbiased engineering service, free from the influence of sales or commercial propaganda.

The committee has other work well under way which will have an important effect upon lighting practice. The sub-committee on specifications for testing commercial glassware has prepared a standard method of selecting, testing and rating lighting equipment. All equipment recommended by a central-station lighting specialist in the future must come up to definite standards. Such a practice is obviously as advantageous to the reliable manufacturer as to the ultimate consumer. The elimination of sub-standard materials from the market is an excellent thing for the electrical industry—it should be aggressively promoted in every line.

**Abstract of report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

A. M. Lloyd
Chairman Committee
on Commercial Cooking

H. W. Derry
Chairman Committee
on Competitive Power

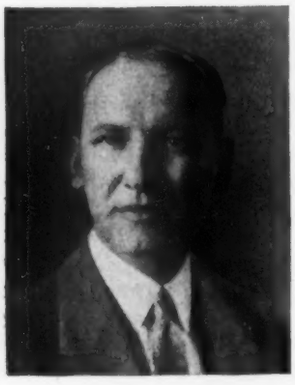
C. L. Harold
Chairman Committee
on Customer Relations

A. B. Collins
Chairman Committee
on Domestic Electric Range

W. H. Sammis
Chairman Committee
on Industrial Heating

J. Daniels
Chairman Committee
on Lighting Service

T. F. Kennedy
Chairman Committee
on Promotional Rates



G. B. Richardson
Chairman Committee
on Refrigeration

C. L. Dunn
Chairman Committee
on Home Lighting

C. E. Greenwood
Chairman Committee
on General Merchandising

C. J. Eaton
Chairman Committee
on Electrical Advertising

R. J. Malcomson
Chairman Committee on
Street and Highway Lighting

L. M. Branch
Chairman Committee
on Transportation

W. C. McWhinney
Chairman Committee
on Water Heating

M. C. Huse
Chairman Committee
on Wiring

Call to Arms in Sales Work*

Chairman J. E. Davidson outlines work of Commercial National Section and appeals for action on market development. Need for more sales and less market study

THE time calls for action along the entire sales front of the whole electrical industry. This is the most important message that any man could bring from the Commercial Section. It is not only a question of the opportunity, which is vast, but of necessity as real as it is pressing. It is not a question of preparedness. It is not one of plan. It is not one of internal betterment, important as that problem is. It is whether or not we are to meet the supremacy challenge of the other great industries.

J. E. Davidson

I know of no industry which has engaged in more numerous or more intensive association activities than has our own. Through the National Electric Light Association, National Electrical Manufacturers' Association and the Society for Electrical Development we have moved energetically to put our house in order, commercially speaking. While it would be premature to say that such task has been accomplished, I do not hesitate to suggest that enough has been done to justify shifting the emphasis of our strategy to the consumer selling front.

Let us for the moment turn our attention from ourselves and look to our markets. Let us measure the pace at which we are moving by the pace of other industries. Let us question the adequacy of what we are doing—the utter inexcusableness of not doing more. There can be no question of the fact that the strides of others prove our pace is too slow. In many respects our market is growing faster than we are. I do not mean to criticise the sales efforts of individual companies nor of individual groups. Splendid individual sales and advertising campaigns are being carried on. Columns are being thrown forward, well ahead of the line of battle. But collectively we are not engaged in that unified and coherent action which alone holds out the promise and the hope of those victorious results to which we are fairly entitled.

In the meantime other producers are eagerly availing themselves of opportunities which are equally ours. I will not burden you with a repetition of the data which have been accumulated through our surveys. Many of you are familiar with the basic facts, which can be boiled down to the statement that not by any means are our endeavors getting the share of the consumer's dollar which is our just due.

The keenest competition of all is not among individual manufacturers, but among industrial units. It is academic to tell you that in our fight for sales we are competing with the automobile industry and the whole roster of great industries among which the consumer distributes his purchases. Why is it that we are not making greater headway? There are numerous answers. But I venture one which few will challenge.

It is a fact that as an industry we have not organized for a powerful and sustained advertising and sales promotion drive to impregnate the entire consuming public with what we call "electrical consciousness." We need this drive, gentlemen. We need it to enhance the pulling power of our product advertising, to sell the idea of these products in advance or in conjunction with our efforts to sell the products themselves. Without it we are depriving our individual and group activities of the free and effective play we all desire.

After two years of close observation and participation in the work allotted to the Commercial Section, I do feel that definite progress has been made toward our objective. A year ago we were far from satisfied. Even now we are far from content. But I have high hopes that another six months will see the fulfillment of our wishes definitely under way. The time is ripe. The need for action is pressing. There has been much discussion. Essential information has been gathered and analyzed. The ground is well prepared. This is the moment to strike—and vigorously.

Primarily, I suppose, we are all thinking selfishly, which perhaps is well enough if we combine constructive action with thought. But there is a great deal more than that beyond our commercial goal. We have come to realize that public utilities are merely the trustees of electric service. It is our duty to give the public every opportunity to secure the comforts and the benefits of more varied electric service.

We have been so occupied with our individual problems that we have been content to accept business as it

**Abstract of report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

came to us. It is true that we have aggressively pushed our respective lines—thinking solely in terms of electric refrigeration, electric irons, toasters and other like appliances. But we have not faced the whole broad canvass of the possibilities of electrical development. Why exult to the country and to ourselves over the wonderful advancement which electric service has brought about? Instead we should point out to every American home owner the fact that we and they are merely on the threshold of almost undreamed-of advances.

In fact, I should like to propose that our rallying cry should be "More kilowatt-hours per capita!" To accomplish this, however, kilowatt-hours must be definitely sold. Hence our aim in merchandising must be to create a real longing for more electrical appliances and to place the appliances in the hands of our potential customers and by intelligent educational methods make sure that they are used.

The "resident kilowatt-hour contest" which has been launched by the general merchandising committee has furnished every member company an excellent barrage for intensifying interest in selling more electrical energy. The purpose of this contest is to promote the sale of one more kilowatt-hour per home per day. Figure experts can see the importance of this movement, for, if the millennium could be reached and every home in the country were induced to use one more kilowatt-hour per day, our electrical energy consumption would increase about six billion kilowatt-hours, bringing in an increased revenue of about $300,000,000. While such a millennium may not immediately come about, without question this contest, if it shall have enthusiastic local support, will do a great deal toward increasing our sales of electrical energy.

Need Co-operative Help

While our part in this program is clear, we cannot rely solely upon our own efforts. We must influence and win the enthusiastic aid of those who can and who logically should back us up. Among them are the retailers who handle, or are in a position to advocate, the purchase and use of good electrical appliances. Architects and builders can render invaluable service. Nor have we pushed electrical advertising—signs, window displays, floodlighting and allied opportunities for the greatest possible consumption of electrical energy. Until now we have left these important matters to the individual initiative of electrical manufacturers and electric light and power companies.

But the cities and smaller towns are by no means our only field for broadening our market. The farm and rural districts present a marvelous opportunity for concentrated effort. Agriculture can be taught to profit by electric motorization just as manufacture has learned its value. While economic conditions in some sections present obstacles, this should not prevent our pioneering in these communities in our work of education. Profits are, of course, desirable but should not be our sole aim. The winning of new friends and a nation-wide, non-sectional good will is of equal and vital importance. Worthy electrical appliances in the nation's homes will cause more word-of-mouth comment and result in more friendly feeling than all the pamphlets ever printed and all the speeches ever made. But first these appliances must be introduced into homes.

To accomplish these things there must be a concerted drive to sell not only appliances but electrical ideas. This is sound business and even sounder public policy. Plans aimed at such end have justified themselves. Power companies have done remarkably well in their urging of the wiring of old and new homes. The need for appliances thus created has been as effectively filled as created. But the surface has barely been scratched. No industry is further from the saturation point than our own.

It is an established fact that 37 per cent of the homes in America are not as yet even wired for electricity. Until they are their doors are closed to us. Even such homes as are wired are still pitifully lacking in the domestic electrical appliances that they might readily and advantageously possess. What are we going to do about it? We have had numbers of local campaigns and occasional national propaganda. During the past year successful schools have been conducted by the electric advertising, industrial heating and commercial cooking committees; splendid work has been done by the refrigeration, domestic electric range, wiring, general merchandising, lighting, transportation, customer relations, street and highway lighting and our other committees.

Practically every patron of these splendid concerns is a logical customer for us. Yet what is the fact? We get a much lower proportion of the public's expenditures than almost any other business. Far less essential businesses are more progressive than the electrical industry. Shall we tamely submit to this? The moment for decision is here. But it must not be a haphazard movement to which we commit ourselves. Whatever large-scale campaign we determine to enter upon must be backed up by special sales promotion material, thoughtfully prepared for the requirements of our individual groups. There must be a close-knit sales-promotion organization in every state and district—a close liaison between our field men and our headquarters activities to energize, facilitate and dovetail every move we make.

Electric Range Committee*

By A. B. Collins, *Chairman*

USUALLY when a new and revolutionary product is announced it meets with overnight acceptance, and this has been true nationally in the case of radio and electric refrigeration.

However, this was not true of the electric range. While its fundamental value was early recognized, its practical application throughout the country was not immediate and the electric range has been required to go through a long period of pioneer development.

Previous range committees have devoted their efforts primarily to research and their findings, which have been published from time to time in the past few years, have enabled this year's committee to put, as it were, the stamp of approval of the industry upon electric cookery.

Therefore, the domestic electric range committee is privileged to present to the industry "The Plan to Sell Electric Cookery."

This comprehensive plan has been developed by the committee in collaboration with the National Electrical Manufacturers' Association and the Society for Electrical Development.

This plan book has been made possible by the many years' work of previous committees and it may be said to represent and express the ideas of those who have participated in the pioneering and development activities.

**Report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

Interconnection

*and Its Benefits**

Some fallacies discussed. Types of interconnection. Publicity values measured. Cases of interconnection benefits cited

By GEORGE N. TIDD
President American Gas & Electric Company

George N. Tidd

WHAT is interconnection? The New Century Dictionary says: "Interconnection is the state or condition of being interconnected." Well, that is like defining salt by saying it is NaCl. But it doesn't explain it. Let us try another angle. Perhaps by examining the objects sought and the results actually attained by interconnection we can arrive at the one fundamental and, having attained it, keep it before us as a guide so as to gage the desirability or undesirability of a particular interconnection by its adherence or deviation from the fundamental object or purpose. But first it may be desirable to explode some notions and ideas and explain what interconnection is not.

FALLACIES REGARDING INTERCONNECTION

What is interconnection? What are the objects and purposes sought by interconnection? Does interconnection mean long-distance transmission of power? Does it mean superpower? Is it the same as its Marxian twin, giant power? Will it of itself bring about that sought-after millennium—the electrification of every farm?

The answer to the last four of these questions is emphatically no. Interconnection has nothing to do with long-distance transmission. The development of the art of long-distance transmission may make possible interconnections that were not feasible before, but long-distance transmission is certainly not the *sine qua non* of interconnection. Nor does interconnection aided by long-distance transmission mean the abandonment of steam generating plants—which will, of course, always be the main source of power—at the local centers, concentrating them all at the mine mouths and transmitting electrical energy from there hundreds of miles to the load. Leaving aside the obstacles to such a procedure due to the lack of necessary cooling water at most coal mines and to the comparative unreliability of transmission, we are still confronted with an almost insurmountable barrier. This is the fact that for any long distance, say one considerably in excess of 100 miles, the cheapest way of transmitting coal-generated kilowatt-hours is in freight cars and in the original state.

Interconnection—or, rather, one form of it—has made superpower possible, but, again, fundamentally, they are independent. Some of the finest examples of perfect interconnections have been recorded between systems that each had only a few thousands in kilowatt capacity—in fact, before superpower was "invented."

Will interconnection solve the problem of electrifying the farm? It will help, certainly. It will make, has already made, possible the extension of rural lines in many sections that would not otherwise be within reach of a power supply, but fundamentally the rural electrification problem is a distribution problem. Traced down, it becomes a problem of finding sufficient users for electrical energy on the farm to make the consumption in the individual installation sufficiently high to bring down the fixed charges of the distribution system to the point where the farmer can afford and is willing to use it. This is a problem not only for utilities but also for the farmers, for the various agricultural colleges and agricultural experimental stations. But interconnection alone cannot solve it.

We again come to the question, what is interconnection? Before we proceed with this let me make a distinction between two types of interconnections. I believe that in a discussion of the situation there is a real gain in dividing interconnection into two classes.

CENTRALIZED PRODUCTION INTERCONNECTION

The first type of interconnection had for its object the tying together of many small and scattered plants and the connection of such a network to a single efficient generating station or to a group of them. It is in the development of this type that the holding companies did such pioneering and lasting service. The object here was the substitution of a single and efficient generating source for the many scattered and isolated plants, or briefly the centralization of generation. The benefits to the holding companies of such a move have been pointed out many times before. But it has not been pointed out often enough that only by such centralized generation has it

**Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

been possible to give the small city, town and village electrical service of the same high standards and at rates equal to those obtaining in the very largest communities. As the size of electric turbines and of stations grew the distance to which it was necessary to reach in order to get together enough load to load a centralized plant increased. The size of turbines and plants had of necessity to be increased because in such increase lay the only hope of cutting costs that were mounting in other sections. This led to interconnection of groups of communities that had in turn been previously interconnected. Carried far enough, this has sometimes been called superpower.

It is to be noted, though, that when groups began to be interconnected some of the advantages that were obtained previously in the tying together of small communities were no longer obtainable. For example, one of the things that disappeared, and very quickly, was the saving due to diversity. Thus, to take a typical case on our own system, on a system peak of 490,000 kw. our diversity between the four major groups was only 15,000 kw., or 3 per cent. This you realize is not very much of a diversity. In general, the same condition will obtain in other systems unless other factors besides geographical extent are brought in, such as the tying together of different types of load—namely, the industrial load and the lighting load—or factors such as a difference in time between systems, or others of the same type. But, broadly, this phenomenon reduces itself finally to one of centralized production similar to the integration that has been going on in other industries. That is the idea some of us had in mind twenty or so years ago. We thought of centralized production as the only means of keeping our heads above water. But, of course, that was before interconnection was discovered.

Interconnection for Mutual Aid

The second type of interconnection, which was developed much later, was generally between systems that were normally completely independent and had an entirely different group of objects in view. Many of these objects have been gone into extensively before. To touch on them lightly here. They are the possibility of staggering construction between independent companies with the elimination of the economic waste that goes with building too far in advance of the load (and yet if construction is to be done economically, it generally has to be done in units larger than the immediate load in most cases justified); the possibility of fuel saving by utilizing during certain periods the more efficient of the plants; the possibility of reducing the reserve or standby capacity, and particularly the possibility of utilization of hydro, and, finally, the possibility of mutual aid in times of emergency.

All of the above, with the exception of the last two, have been gone into many times before the association and elsewhere. In the case of the utilization of the hydro facilities, however, interconnection can particularly claim this as one of its definite accomplishments, since it is only through extensive interconnected systems that this has been made possible. To cite a specific example: In one case where we have a hydro capacity of approximately 20,000 kw. distributed among four stations, it has been found necessary on Saturday afternoons and Sundays to transmit a portion of this capacity into a network extending over a distance of more than 320 miles from the source in order to utilize fully even such a small capacity; but the result of such an interconnection was fully shown in the kilowatt-hour output of this little hydro system. For a number of years before it was interconnected it averaged only around 76,000,000 kw.-hr. per year, but when the interconnection was completed the annual production went up to about 105,000,000 kw.-hr., a net increase of 38 per cent. The result of this increase is, of course, a saving of natural resources. The other object and accomplishment of interconnection—mutual aid—has, it appears to me, been almost altogether neglected, and not only has it failed to receive the proper amount of publicity, but very often the publicity that was given to it gave the wrong viewpoint and the wrong conclusion to the average man who read in the newspapers what was being done by interconnection and what its direction and aim were.

Mutual Aid Paramount

It seems to me that, after considering all the benefits that are possible to the systems making an interconnection—and we are talking now of independent systems each one of which is in the position of being able substantially to carry its own load—and to the public, the combined weight of all of them will generally be less than the weight of the possibility of rendering mutual aid. Time and again I have had analyses of possible interconnections brought to me, made on a strict engineering basis, where apparently sufficient benefits, particularly benefits from a dollar and cents viewpoint, were not evident to justify the expenditures involved to make the interconnection, and I have had to take the burden of deciding whether or not the interconnection was to be carried through. In almost every case of that type the decision has been to make the interconnection on broad general principles, and again in almost every case subsequent operation has more than justified the decision.

It is possible for a utility so to design and build its system that it will be able to take care of every contingency—possible, but hardly justifiable. For if the system is to be built to withstand emergencies that cannot be foreseen, we enter into a period of guessing how far to go in providing for contingencies. We may take, for example, in the case of a power house or a substation, the highest level of flood water recorded and design our station to be safe against that, but to be really safe we ought to take into account the possibility that the previous high-water mark may be exceeded. Such occurrences are by no means rare. In doing that, if we want to be safe, we enter, as stated above, into a period of guessing, and such guessing continued throughout the entire system will open the floodgates of expenditures that would just as surely engulf us as would the physical water from the floodgates of heaven. We have a choice, therefore, between two methods of drowning.

Not Prudent to Stand Alone

Is there no way out of the situation? There is none, if each system is going to stand alone and on its own. But it is not good for a utility—it is not wise, it is not prudent—to stand alone or to be alone. The alternative is to interconnect. Too often have we seen cases of trouble develop on systems—I have seen them happen numbers of times on our own system and have heard of many other cases on other systems—that would invariably have resulted in a partial cessation of service, and often in complete cessation, were it not for the fact that help was available through an interconnection which made it possible to carry on and keep service uninterrupted and unchanged just as if nothing had happened. And this

brings me to a point that I have always felt has been almost totally overlooked in informing the people whom we serve of our activities. I will go further and state that on many occasions the information that we have given out has been of such a kind as to leave the layman with an impression wholly at variance with the facts and one that cannot help but be ultimately of considerably harmful effect to the utilities.

Harmful Publicity

Why have utilities been so eager to rush into print with news of the various long-distance and spectacular interconnections that have been made? For example, the interconnection that was made between Chicago and Boston. Were these connections in any sense new accomplishments to be particular proud of? Certainly they involved no new engineering accomplishments in bringing to a conclusion a long-planned project. Here certainly they meant nothing significant from an economic standpoint. As a matter of fact, they were hardly more than stunts or tricks carried out by a few overzealous and young load dispatchers who could not resist the temptation of setting up this technical toy that was placed within their too ready reach. Granting, however, that no harm was done by carrying through the interconnection, there was still considerable harm done in broadcasting through the nation, as in that particular case, that power from Chicago, for example, supplied lamps in Boston. The harm consisted in conveying and giving to the public in general the idea that steam-generated power could economically be transmitted from Chicago to Boston, or that anybody who had any sense of responsibility would permit the carrying through of a project economically and technically so unsound. If publicity is sought in cases like that, let us adhere to the prosaic facts. Let us not stress the romantic side, even though that side has better publicity value.

Hook-ups of the kind alluded to, when carried out, have a certain amount of actual value, but the value is always no greater than the weakest link in the hook-up, and that, when examined carefully, will be found to be a link having a capacity of from 5,000 kw. to 15,000 kw. on the interconnections made to date. By a process of substitution or passing along it would be possible, therefore, to make available the capacity of that smallest link from one end of the system to the other; but that is an entirely different affair from transmitting energy from one extreme end of that system to the other end.

Failure to Give Desirable Publicity

Instead of stressing the "stunt" aspect of interconnection, why do we not proclaim and broadcast the real deeds of interconnection every time one is accomplished? Why would it not be desirable to tell the public of the troubles that we encounter and the troubles we get into owing to the fact that apparatus, no matter how perfect, and plants, no matter how well designed, break down, and of the relief brought so instantaneously through the medium of interconnection that the public served is unaware that trouble has even occurred? Interconnection has accomplished wonders in this regard, and all with modest expenditures, which it was possible to absorb without any reflection in an appreciation of rates; but with a tremendous reflection in the way of improvement in service to a point where today absolute continuity is the only criterion by which service is measured. In the case of our own interconnections we have kept a record of the number of cases where interconnection has saved service in the last two years and these have run into more than thirty. Let me cite a number of them taken at random from our files:

Case No. 22.—In November, 1927, unit No. 1 at the Philo plant of the Ohio Power Company, which has a rating of 40,000 kw., developed internal trouble and was taken out of service for inspection and repairs. Two weeks later, and before unit No. 1 was replaced on the line, unit No. 2 of the same capacity developed internal trouble also and was removed from service, thus completely shutting down the Philo plant and reducing the capacity of the Ohio Power Company system by 80,000 kw. It was not possible to get unit No. 1 back in service until the following week. The accident to unit No. 2 was on a Saturday, and, owing to the fact that the load was light then, the system did not feel it; but when Monday came around the interconnections were immediately pressed into service and the following arrangements were made:

The connection with the West Penn Power Company was called upon for an additional 15,000 kw. The connection with the Ohio Public Service Company was called upon for the maximum possible load. The Cleveland Electric Illuminating Company was called upon, and it responded with a promise of all that could possibly be carried on its 66-kv. cables between Lake Shore and Oak Street substations, allowing approximately 50,000 kw. to feed into Akron and from there in turn into Canton, which is a point on the Ohio Power Company's system, this amount being fully 30,000 kw. above the normal supplied by Cleveland. The interconnection with the Southern Ohio Power Company was called upon, and that company responded with a promise of 5,000 kw., although later on it was found that this was not really necessary. The system south of the Ohio River, which had been receiving some help from the Ohio Power Company, was asked to call, in turn, on its interconnections, so that the Ohio Power Company was relieved of all necessity of helping it. Some of the minor interconnections were called upon for their quota. The result of all this was that the interconnected system load of the Ohio Power Company and the companies connected with it was carried without the slightest disturbance or hitch on Nov. 29 and until noon of Nov. 30, when one of the Philo units was placed back on the line. The load continued to be carried without the slightest interruption with a lesser call upon the interconnections until Dec. 4, when the second unit at Philo came on the line. In all of this, it may be noted in passing, no interconnections were called upon to transmit quantities of energy any long distance, but each interconnection was called upon to feed into that portion of the system where it was tied in its quota or its available amount of power, in some cases the relief being actually obtained by a substitution process.

Here was a contingency that could not possibly be foreseen or, if it had been foreseen, be designed for, and yet, through the help of interconnection, service to an industrial territory extending many thousands of square miles and to hundreds of thousands of consumers went on without the least disturbance.

Case No. 10.—The West Penn Power Company, which is interconnected with the Ohio Power Company at their joint plant at Windsor, W. Va., and at other points, had a case of trouble on July 13, 1927, at its Springdale plant. Unit No. 2 developed blading trouble and had to be pulled off the line. The operator pulled unit No. 1 off the line at the same time as this turbine was hunting and he believed it was also in trouble. This reduced the capacity of Springdale by 40,000 kw. At once the West Penn system itself picked up 5,000 kw. and the interconnected system picked up 35,000 kw. of this load. In the meanwhile the West Penn system brought additional capacity into service at its various plants, but it took approximately one hour to get this capacity on the line. During this entire period the interconnected system took care of 35,000 kw. and service to all the consumers of the West Penn Power Company continued without the slightest disturbance. What a beautiful story there is to tell here of the value and accomplishments of interconnection!

Case No. 31.—On March 29 and 30 of this year the northwestern section of Ohio experienced the most severe sleet storm that had been encountered in more than twenty years. The territory served by the Ohio Power Company in that section of Ohio is mostly agricultural, with a very small amount of industrial load. The loads are scattered and many miles of transmission line are necessary to serve it. The entire territory is served by two lines radiating from Lima, but during the sleet storm both went down, 88 poles being lost in a distance of about 16 miles. This division, however, is interconnected with the Defiance plant of the Toledo Edison Company. When Defiance was notified of the trouble it immediately picked up a portion of the system load—that is, that portion that was not in trouble—and as the lines were repaired the service was extended from Defiance. The Defiance plant continued to carry the load on all the northwestern division of the Ohio Power Company until Thursday, April 5, at which time the lines radiating from Lima were again placed in service. Here

is another case of interconnection saving many days of interruption in an emergency which could not possibly have been foreseen or economically have been provided against except through interconnection.

I could cite many more cases, but you all are probably familiar with as many as I. The point is, however, that almost daily we have brought to our attention examples of what wonders interconnection is doing in the way of improvement in and maintenance of service without staggering expenditures, and almost daily we are missing opportunities to tell our customers, to tell the people of the villages, towns and municipalities in which we operate, to tell the nation, of what we are accomplishing by interconnection, of what interconnection is doing, of the fundamental thing that we are striving for in interconnecting. How much longer can we go on missing these opportunities?

Customer Relations Committee*

By C. L. Harold, *Chairman*

IN TWO aspects the committee determined at the start of the year upon a policy of expansion. First, in accordance with recommendations of the previous committee and national headquarters, beginning in November, 927, the Service Suggestions have been published each month in the National Bulletin in lieu of the previous plan of printing a separate monthly folder under the title of "Service Suggestions" and mailing to a selected list of commercial and other executives.

Second, the committee thought that it should enlarge its usefulness by not only preparing and publishing monthly a Service Suggestion and gathering data in connection therewith, but it should also assemble information on other subjects which, although pertinent to customer-relations work, were not appropriate for general publication. The work has progressed considerably in this direction and we seize this opportunity of emphasizing to member companies the availability of this particular phase of committee service to individual member companies that might be interested. Member companies are invited to indicate freely their need for research or investigatory work which the committee is organized to perform and whose results we believe are not of sufficient general interest to warrant broadcasting to the entire fraternity.

In changing the method of disseminating Service Suggestions, the underlying thought in the plan of National Bulletin publication was that not only would the circulation or publicity be increased, but that any selected list for mailing a separate pamphlet monthly would almost certainly omit many individual employees of member companies whom it would be impossible to identify as interested in customer-relations problems.

The following Service Suggestions were issued during the present administration:

November, 1927—"The Executive, the Employee and the Customer Meet on the Job."
December, 1927—"Branch Office Layouts Designed for Better Customer Relations."
January, 1928—"Questions and Answers on Telephone Standard Practice."
February, 1928—"Educating Customers to Replace Blown Branch Fuses."
March, 1928—"Desk Contacts versus Counter Contacts."
April, 1928—"Résumé of Service Suggestions Issued by Customer Relations Committee."
May, 1928—"Use of Mechanical Devices in Complaint Handling and Appliance Demonstrations."
June, 1928—"The Customer and the Bill."

Inquiries for additional information from various members and member companies were received regarding every one of these suggestions. The résumé of all of the Service Suggestions issued by the committee since 1921 which appeared in the April N.E.L.A. Bulletin brought in requests from 45 members and member companies for approximately 2,500 copies of various Service Suggestions which have been reproduced and are now in the mails.

Abstract of report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.

Prize Awards

Charles A. Coffin Medal:

Puget Sound Power & Light Company (see pages 1196 and 1197).

Doherty Medal:

J. M. Whittier, Edison Electric Illuminating Company of Boston, "Industrial Development by the Central Station."

H. M. Byllesby Prizes:

First—Herman L. Gruehn, United Gas Improvement Company, "Pensions."

Second—L. W. Clark, Utica Gas & Electric Company, "Economic Forces and the Public Utility Accountant."

Third—Claron D. Barber, Commonwealth Edison Company, "The Accountant and the Industry's Advancement."

Martin J. Insull Prize:

Gail Belden, Middle West Utilities Company, "The Economics of Public Relations."

James H. McGraw Prizes:

First—B. M. Riker, Charles H. Tenney & Company, "Industrial Electric Heat."

Second—Edward P. Price, San Antonio Public Service Company, "Lignite as a Commercial Fuel."

Third—W. T. Blackwell, Public Service Electric & Gas Company, Newark, N. J., "Street Lighting."

Arthur Williams Prize:

H. W. Derry, Union Gas & Electric Company (Cincinnati), "Getting Your Share of the Power Business."

Harriet Billings Prize:

Cladd H. Chase, Brooklyn Edison Company, "Effective Good Will Work Performed by the Distribution Department."

Frank W. Smith Educational Prize:

Edwin D. Smith, Northern New York Utilities, Inc.

Farmers Machinery-Minded*

Factory methods welcomed. Electricity the needed agency. Economics of farm service. Methods advocated by farmers

By Clifford V. Gregory
Editor "Prairie Farmer"

ENGINEERS tell us that productive efficiency in this machine age depends largely on the use of power. From that standpoint the farmer ranks high. The average farm worker uses 4.5 hp., while the average industrial worker uses only 3.6 hp. In industry the average horsepower per man increased from 1.9 in 1899 to 3.6 in 1925, while in agriculture the average increased from 2.2 in 1899 to 4.5 in 1925.

The farmer of today is machinery-minded. That is nowhere better illustrated than in the grain belt of central Illinois, where for generations farmers have produced their crops with power machinery, until they no longer like to work with their hands. They hate to turn a crank, and who can blame them? They do not like to milk cows. They have been slow to turn from grain production to dairying and other intensive types of farming, notwithstanding all the educational efforts of the agricultural colleges.

Electricity is going to succeed where the professors have failed. It will succeed because it is making livestock farming a machine operation. When you can prepare the feed, do the milling and take care of the milk by machinery you have removed the obstacle that has kept the grain farmer from making the readjustment that he knows he could make at a substantial profit.

Dairy and livestock farming are profitable because they make a factory of the farm. It no longer sells raw materials. The dairy cow and the hog and the hen put the grain through at least one process of manufacture. On the farm which is equipped with electric power and electric refrigeration still other steps in the manufacture of finished food products are possible, and the profits of the farm are increased accordingly.

Farmers are thoroughly "sold" on the value of electricity. How are they going to get it? Certainly not through "juice peddlers"—promoters who build a line for a group of farmers at excessive cost, buy energy from a central station at wholesale prices and retail it to the farmer customers. Often they never get to that stage. They collect the farmers' money, build the line, and then go off and leave it to shift for itself. These promoters are parasites on the industry and have done more than everything else together to give it a black eye in the country.

Opinions on Methods

Many companies have been following the practice of building country lines at the expense of their farm customers, in some cases returning the cost to them as a deduction from their monthly bills over a series of years.

Clifford V. Gregory

This plan does not encourage a large consumption of electricity, as the farmer is compelled to invest so much money in the line that he has little left for the purchase of equipment.

A plan which is being rapidly adopted, and which seems to be the most practical, is for the companies to build the farm lines at their own expense. in return charging a high monthly minimum. Four of the leading companies in Illinois, for instance, are now financing farm lines to the extent of $450 per farm and making a minimum monthly charge of $10 for energy furnishing 135 kw.-hr. for this price, with a charge of 3 cents per kilowatt-hour for any excess. If the farmer customer will buy equipment with the $450 which he might otherwise spend for line, he will make electricity a profitable investment both for himself and for the power company.

I. W. Dickerson, farm mechanics editor of the *Standard Farm Papers*, has given me the following figures to show the effect of equipment on consumption of energy: Lights only, 34 kw.-hr. per month; $100 worth of equipment, 68 kw.-hr.; $250 worth of equipment, 84 kw.-hr.; $300 worth of equipment, 117 kw.-hr.; $400 worth of equipment, 127 kw.-hr.

As a help to the more rapid extension of power lines into the country on a mutually profitable and satisfactory basis, I wish to conclude with the following suggestions:

1. The valuable experimental work conducted at the instigation of the National Electric Light Association should be continued, in order that we may learn still more about profitable applications of electricity to farm operations. Studies should be made of the place electricity holds in profitable systems of farm management.

**Abstract of address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

2. Rural lines should be built by the power companies. The farmers' money should be spent for equipment rather than for lines.

3. Erection of rural lines by irresponsible promoters should be discouraged.

4. Rates should be based on the principle of a relatively high minimum with a low charge for excess energy, in order to encourage increased consumption.

5. The question of prompt servicing of rural lines should be given more attention. As the farmer places more and more dependence on electric energy, he must be assured a supply that is practically free from interruptions.

6. Efforts should be made to supply electric equipment that is especially designed for farm requirements, and costs should be reduced if possible.

Thunder and Lighting*

By Clayton Rand
President the Dixie Press

IT IS a far and endless journey to the first picture that I would flash upon the screen of your fancy, for we find ourselves by the side of the man who first invented fire, in the flame of which he warmed his body and the rays of which spread light in his dank and dark, crude cave. I see him cooking for the first time the meat that heretofore he had eaten raw and setting up with his signal fires the first lines of communication. This ingenious primitive, playing with fire, was writing the first few wavering lines of the history of light and power.

The great achievements of light and power are better measured in what has been accomplished for modern man, as it has multiplied his power, increased his usefulness and reduced the burdens of living. I do not have to go back very far to picture my mother over a washtub, the insufferable heat of a wood cooking stove, on a warm summer's day, with an old-fashioned flatiron, and refrigeration limited to an occasional cake of ice wrapped in a piece of newspaper and stored in a box. I can picture the endless labor of that home, broom-swept, the hand-manipulated churn and the vigilance of an old-fashioned coffeepot.

Yesterday America was but a fumbling child among the nations of the earth, largely agricultural, as a whole a carrier of wood and water for the financial barons of England and Europe. Today under the magic touch of light and power, with half the world's motors in operation, each one of us has more mechanical slaves at his command than had our forefathers on the plantation in the palmiest days of the ante-bellum South.

Mechanical Slaves Now Used

But I look upon electric power as a force as spiritual in its operation as it is material in its results. Long before the discovery of electricity did men not refer to the unfathomable soul within them as a spark divine? Who knows but that the search of science may yet reveal that this spark within is one electric, impregnated with the fire of an infinite God, energized with the processes of creation? And it would seem to me that the purpose that should inspire the work of you men and women who represent this great power for good in the increased happiness and prosperity of the world should be the consciousness of the fact that there is something well-nigh sacred in the way you use it—a strange force and power which, though utilized and somewhat understood, is yet as unfathomable as the fires which are kindled in the soul.

Clayton Rand

I appreciate the fact that power today is standing trial. I, too, have heard the voice of the critic in high circles, who stirs the emotions of his constituency by the charge that the so-called "power trust" is without soul or mercy. I also see in this great business of light and power men and women who are dreamers and builders, who through the years are constructing out of their faith and fancy the most formidable force that has been released in the experiences of men.

If you can conscientiously say that your purpose is one for the promotion of greater happiness and prosperity among the people, the voice of the "knocker," though never silenced, will become, in the light of truth, but "sounding brass and tinkling cymbals." I know intimately some of the great exponents of light and power in America, and I believe that I can testify that these men are moved by the bigger vision and the larger responsibility they owe their fellow men. I believe that they are dreaming and building to the end that this nation shall become one, not only completely electrified, but also fired by the faith of a conviction that will know no defeat until all of their high ideals are gloriously achieved.

**Abstract of address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

Good Merchandising Practice*

Fundamentals of merchandising outlined. Utility merchandising methods discussed and many methods and practices condemned

By Oswald W. Knauth
Vice-President R. H. Macy & Company, New York

TO A merchant the distribution of electrical goods is a part of distribution in general. The merchant, therefore, attempts to apply the same policies to electrical goods that he finds successful in other goods, and I think, if you will follow me, that I can best begin by stating a few fundamentals of merchandising and then see how those merchandising necessities link up with the particular peculiarities of the electrical business.

Oswald W. Knauth

I am always irritated when I hear a man say that the problem of merchandising is to have the right goods at the right time at the right prices. This statement makes it all seem so simple, and yet it is pompously enunciated as a profound truth over and over again. When we try to make a proper selection of electrical articles to offer our customers, we are confronted by a double problem.

First—We wish to offer them a proper choice of toasters, urns, flatirons, percolators, and so on, at varying prices and of varying designs. But then we find that different customers also prefer different types of make, some of which are in complete lines and others cover only a few articles. If, therefore, we attempt to carry a complete line of each different make, we find that we have a tremendous confusion of choice and great difficulty in keeping in stock on all of the items which we are carrying. Now, our object as merchants is so far as possible to help the customer in his choice, and to do this properly we must make that choice as easy as circumstances permit. Good merchandising would, therefore, demand one of two practices—either that we carry in any one store one complete line or that we carry such items out of each line as we believe to be the best, the whole, of course, constituting a complete selection.

Second—Good merchandising demands the satisfaction of the customer in buying what he or she wants. An article must not only be sold at a profit, but also must carry with it a certain amount of good will, which encourages the customer to come back and keeps the store going next week and next year. Salesmanship should be directed to this end, and our whole policy of allowing exchanges and so forth is to insure the fact that our salespeople do not oversell a customer. In order to accomplish this, salespeople must be controlled by the store and must be definitely supervised from the customer point of view.

Third—The costs of distribution vary greatly. It is too often taken for granted that these costs are of a definite fixed percentage. In fact, I wonder if the costs of distribution do not vary as much as the costs of manufacturing. For instance, advertising cost varies from 1 to 6 per cent. Rent varies with the volume of business done in a given space, from 2 to 10 per cent. Selling cost varies with the possibility of sales in different locations and with the excellence of service. Let me illustrate for a moment the causes for the variations in the cost of salesmanship. Every store does about double its average monthly business in December. Every store does a fraction of its average monthly business in July and August. Every store is much busier on Saturday than on any other day of the week. Every store is comparatively empty from 9 to 11 and from 4 to 5:30 and very busy between 11 and 4. Now, if we were to have enough trained salespeople to take care of trade in December on a Saturday between 11 and 4, we must be tremendously oversupplied in July on a Monday between 9 and 11. Therefore, we must make some arrangements which will offset this wide hourly, weekly and monthly variation. We do it by means of daily part timers; who come in at 11 and leave at 4; we have Saturday specials, who come in only on Saturdays, and along during the fall we build up a surplus force to take care of the Christmas rush. But at that we only do a partial job—

*Address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.

partial because the irregularities are so spasmodic and because we cannot pick up as expert sales clerks for such irregular intervals as we demand for our minimum business. You can see from this that every store must choose between great expense for selling and some degree of poor salesmanship, and the way in which each store chooses brings about a particular character for that store and a comparatively high or low cost of selling. This cost of selling may vary from 3 to 10 per cent.

Fourth—The completeness of choice varies in different stores. Some stores have a policy of low stocks and rapid turnover. Others have a policy of carrying exceptional articles for exceptional customer requirements. It is easy enough to achieve high turnover by keeping only such articles as are in normal demand. This means a low cost of storage and of inventory and ease of handling. It would seem to be the thing to do were it not for the sacrifice of good will when some customer demands some peculiar color or material or shape and has to go elsewhere to find it. That customer's normal trade is also likely to go elsewhere under these circumstances. Yet no store can afford to fill itself up with abnormal articles, for these rapidly turn into junk. Where to draw the line? This is the practical problem with which we merchants are faced, and it is as we answer this that we build up stores having different characters and having different rates of expense. These expenses are shown particularly in markdowns, which may vary from perhaps 2 to 10 per cent, but they are also shown in more or less expense of store operations.

Methods of Utility Merchandising

Now let us look at the methods of retail distribution which you have built up in the electrical industry and see how they fit in with the demands of good merchandising. You have built up your systems on (1) more or less complete lines of articles; (2) an indicated retail price for each of these articles; (3) special demonstrations for the particular pushing of each line; (4) extensive advertising to build up a demand for your particular articles and for your name in general.

This system brings it about that you simply have to bring your articles into a store, be given floor space, and sales result. Prices are made, the demonstrator demonstrates, the public demands, and the supply is at hand. It is all very complete and very well worked out, and it is the easiest way for the storekeeper. And it works. Evidences of this are available at every hand. I need not go into this any further in such a gathering, for I know you are all familiar with it. I can therefore turn immediately to the problem of adapting this system to the necessities of good merchandising. I just want to interject one remark at this point: that is, that the necessity of sound merchandising is far greater today than, say, twenty-five years ago. There are more good merchants in the field, and competition is infinitely more keen. We cannot afford loose methods or loose thinking if we are to stay in business. Proofs of this are available at every hand.

Now, when your system is introduced into a store it brings about several grave difficulties from a merchandising point of view:

First, it brings about a duplication of similar articles if several lines are carried which really do not add to the customer's range of choice. This means more display space, difficulty of keeping in stock on the increased range of items, confusion in the stockroom, a multiplicity of many small orders. All this means that a store is apt to be sold out on its best-selling articles and add to expense generally.

Second comes the difficulty of bringing a customer to a rapid and certain choice. Why this toaster against that at the same price? The more she sees, the more uncertain she becomes. You attempt to meet this with your expert demonstrators, who can talk with conviction on the small conveniences and the hidden excellences of different devices; but when several demonstrators demonstrate conflicting excellences the confusion of the customer ends in rapid flight.

Third, your extensive advertising certainly familiarizes the public with your name and makes for ease of selling, unless the customer happens to bump into a rival display and demonstrator first. Then anything may happen. The demonstrator may play fair and sell rival goods, or may enter into a rapid supersales argument, or may disparage the other line and thus cast a doubt over electrical goods in general from which we all suffer. All this is impossible to control.

Fourth, is your practice of naming the retail price in advance. This is the easy way. But it is impossible from the point of view of really good merchandising—partly, as shown above, because the costs of merchandising are not fixed, but widely different; more especially, however, because the naming of the best retail price is a difficult matter and cannot be done at long range.

Utilities Not Good Merchandisers

I come then to the conclusion that your system of selling is incompatible with the best merchandising practice. It may be effective for the small store in a small town. But it conflicts fundamentally with the necessities of large scale, economical and efficient merchandising practice. And a more effective way out must be found.

Before closing I want to add a few remarks in regard to the burning problem of public utility retailing of electrical goods. I do not take this problem of competition as seriously as some of my colleagues, for it has been my observation that the public utility methods of merchandising are so clumsy that they cannot be a menace to us, in spite of their many advantages, as long as we are as expert as we must be. Moreover, this public utility competition is not a national problem, because practices vary widely in different localities. Even were it dangerous, I cannot see on what grounds we as retailers can prevent public utilities from going into retailing or attempt to dictate to them what their policies should be. As a matter of fact, their policies can often be compared to existing retail policies, even if these are unsound and unsuccessful policies.

But I do raise one question with all earnestness to those who guide public utility policies. As I take it, you are interested in the sale of electrical goods, not for their own sake, but for the sake of increasing the consumption of energy. If this is the case, would you not be wiser and more successful if you studied the question of increasing these sales through the existing retail organizations, whose outlets are widespread and well-established, rather than add a single or several retail outlets, whose sales are an insignificant part of the total? Your present methods irritate and annoy the retailers who must make their living out of distribution alone. Why create this ill will? Would it not be more effective to study how to help them increase their distribution, so that increased energy will be consumed? And are there not greater possibilities of such increase than by setting up a rival distributing system of your own?

What's New About Lamps*

By FRANK W. SMITH
Chairman Lamp Committee

Frank W. Smith

DURING 1927 a total of 305,000,000 large tungsten-filament lamps were sold in the United States. This is an increase of 3.7 per cent over the previous year's sales as compared with an 11.8 per cent increase of 1926 over 1925.

In addition, 12,600,000 large carbon lamps were sold in 1927, of which about 22 per cent were of domestic manufacture and the remaining 78 per cent were imported. The total large carbon lamp sales in 1927 were 31.8 per cent less than in 1926, which was virtually due entirely to the decrease in imported lamps. The sales of domestic-made large carbon lamps have remained about constant during the past three years, something less than three millions each year.

Most of the imported carbon lamps are sold to the public through the 5-cent to one-dollar chain stores, so it would appear that the considerable reduction in the sale of these lamps is largely due to the publicity given during the past year on the "costly bargain" of the carbon lamp to the home user.

The figures stated above do not include miniature lamps, such as those used for flashlight, Christmas-tree and automobile service. These data are as follows:

	1926	1927
Miniature Tungsten Filament		
Flashlight	32,700,000	37,380,000
Automobile	116,300,000	116,500,000
Christmas tree	34,350,000	44,350,000
Miscellaneous	4,990,000	6,900,000
Total miniature tungsten filament	188,340,000	205,130,000
Miniature Carbon Filament		
Christmas tree	12,680,000	13,415,000
Miscellaneous	1,030,000	1,050,000
Total miniature carbon filament	13,710,000	14,465,000

Christmas-tree lamps are generally supplied with current from central-station service, and as the current consumption of eight of these miniature lamps is the equivalent of one 40-watt lamp, the 1927 miniature Christmas-tree lamp sales are the equivalent in watts consumption of about 7,250,000 40-watt lamps, an increase of 20 per cent over 1926.

Table I presents the average lumens, watts and efficiency (lumens per watt) of large lamps sold during the past three years, and Table II presents the relative demand for lamps during the past three years, divided into voltage groups. Table III shows the relative demand for the more important sizes of lamps during the past three years.

The average light output of street series lamps sold in 1927 was 2,293 lumens, slightly less than that of the year previous. The relative demand for the different sizes and ampere ratings of street series lamps during the past three years is shown in Tables IV and V.

During the past year the matter of voltage standardization has again been brought prominently to the fore through a revision of the book "Central Station Voltages," the last preceding copy of which was issued in 1923. The 1923 book was a cumulation of all the information obtained for several successive revisions and showed the proper lamp voltage for a total of 14,639 communities. With a campaign consisting of only one original letter and one follow up letter, the committee received information for publication in the 1928 book, covering 18,868 communities. Of the towns listed in the 1923 book, 3,917 are not covered in the recent issue, because the company supplying did not respond to the committee's inquiry. The 1928 issue includes, however, 7,746 towns which are listed for the first time.

The greatly increased coverage of the new voltage book is due in part to the greater interest of the industry in the matter of proper voltage conditions and in part to the ramifications of the large systems, some of which reported lists of communities served ranging up as high as 500 towns. Another reason for the greater coverage is

TABLE I—AVERAGE LUMENS, WATTS AND EFFICIENCY OF LAMPS SOLD EXCLUDING MINIATURE LAMPS

	1925	1926	1927
Average lumens	712.0	747.0*	732.0
Average watts	57.6	59.6*	59.0
Average lumens per watt	12.4	12.5*	12.4

* Corrected 1926 values.

**Abstract of report presented at the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

TABLE II—DEMAND BY VOLTAGE GROUPS, PER CENT

	1925	1926	1927
115-volt group	88.8	89.6*	89.9
230-volt group	3.5	3.3*	3.2
Street series group	1.5	1.7*	1.6
Street railway group	1.6	1.5	1.4
30-volt and 60-volt group	3.4	3.1*	3.1
Miscellaneous	1.2	0.8*	0.8
Total	100.0	100.0	100.0

* Corrected 1926 values.

TABLE III—DEMAND FOR LAMPS BY SIZES, PER CENT

	1925	1926	1927
10 watts	4.5	3.8	4.1
15 watts	4.0	5.0	5.0
25 watts	22.2	20.4	21.6
40 watts	14.9	15.2	14.4
50 watts	18.4	17.3	16.5
60 watts	8.9	11.6	12.7
75 watts	7.4	4.9	3.4
100 watts	7.7	9.5	10.3
150 watts	1.8	2.1	2.4
200 watts	2.8	3.0	3.0
300-1000 watts	1.1	1.1	1.0
Street railway	1.6	1.5	1.4
Street series	1.5	1.3	1.5
Miscellaneous	3.2	3.3	2.7
Total	100.0	100.0	100.0

TABLE IV—DEMAND FOR STREET SERIES LAMPS BY SIZES, PER CENT

	1925	1926	1927
Less than 600 lumens	9.9	2.6	1.6
600 lumens	23.5	18.3	18.2
800 lumens	7.7	6.7	7.1
1000 lumens	25.4	30.0	30.0
2500 lumens	12.2	17.7	17.7
4000 lumens	8.9	12.7	12.3
6000 lumens	9.3	9.8	10.2
10000 lumens	3.1	2.2	2.0
Miscellaneous	...	...	0.9
Total	100.0	100.0	100.0

TABLE V—DEMAND FOR STREET SERIES LAMPS BY AMPERE RATING, PER CENT

	1925	1926	1927
4.0 amp	5.1	3.0	3.5
5.5 amp	9.2	3.9	5.7
6.6 amp	60.1	64.4	64.7
7.5 amp	10.8	10.1	8.8
Compensator	12.6	18.4	16.6
Miscellaneous	2.2	0.2	0.7
Total	100.0	100.0	100.0

the trend in recent years of municipal plants to sell out to private companies or buy their energy wholesale from private companies. In past years it has been very difficult to secure voltage information from municipal plants.

Table VI gives a detailed statistical summary of the new voltage book as well as a comparison with similar data for 1923. The outstanding changes with respect to voltage in the five year interval are:

1. A shift of approximately 20 per cent of the total volume of service from 110 volts to 115 volts.
2. An increase of approximately 3 per cent in the percentage of total service at 120 volts.
3. The unification at one voltage for the entire city of over 50 per cent of the total volume of service in cities formerly supplied at more than one of the three standard voltages.
4. The practical disappearance of all lighting voltages other than 110, 115 or 120 volts.

In order to get a complete picture of the relative status of the three principal voltages, the populations of the communities having more than one voltage have been allocated to the individual voltages.

The object of compiling the voltage book is to eliminate as far as possible those instances where too high a voltage of lamps is supplied. The disadvantages, which are well known to the companies but not generally known by the consumers, resulting from operation of lamps of too high a voltage, are:

1. The customer receives less light and at a greater cost per unit of light.
2. The central station loses kilowatt-hour sales due to the decrease in wattage consumption of the lamps.
3. The manufacturer and dealer lose lamp renewal sales.

It is therefore to the best interest of all parties concerned that only lamps of proper voltage be used. A realization on the part of the dealer of the harm resulting from using lamps of improper voltage will almost invariably result in a change to the proper voltage.

The voltage book has been distributed broadcast throughout the electrical industry to all wholesale distributors of lamps so that they may have comprehensive information at hand as to voltage of lamps which should be shipped into the various communities they supply. Coincident with this, the lamp manufacturers are conducting a campaign with the wholesale distributors to the end that their full co-operation shall be rendered in supply of proper voltage lamps.

TABLE VI—ALLOCATION OF POPULATIONS TO INDIVIDUAL VOLTAGES

Voltage	Approximate Relative Total Volume of Electric Service, Per Cent		Change
	1923	1928	
110	36.3	15.9	—20.4
115	40.9	61.6	+20.7
120	19.4	22.4	+ 3.0
Odd voltages between 100 and 130	2.7	0.1	— 2.6
High voltages, 200 and above	0.7	.....	— 0.7
Total	100.0	100.0	

In order to realize the full benefit of this whole endeavor, it is necessary that the local retail dealers in lamps be in harmony with the central station in the matter. The most effective point of contact with the retail dealer on this subject is through the central station. All possible angles of approach to the problem of eliminating wrong voltage of lamps will have been covered if each central station gets out a circular letter to the local dealers advising them of the proper lamp voltage and of the losses in case a higher lamp voltage is supplied.

Engineers for Economy*

Strive to get more out of investment dollars. Outline methods for planning system development. News of engineering activities

By E. C. STONE
Chairman Engineering National Section

E. C. Stone

WHILE there have been no radical advances in engineering practices during the past year, analyses of the work of the various committees show definite progress in the development of ways and means of obtaining "more system capacity per dollar of investment."

In power generation, intensive study has been given to the subject of availability for service of installed generating capacity. Actual performance data covering a large number of both steam turbines and water wheels over a period of years have been analyzed and published in serial reports of the prime movers and hydraulic power committees. Obviously, accurate knowledge as to the expectancy of outage to generating machinery will permit of more accurate determination of the installed capacity necessary to carry given loads. Because of the important part of the total system investment that is included in generating capacity this is an important item in over-all system costs.

The thermal efficiency of power generation from steam has been further improved. It is found, however, that the maximum efficiency is obtained only by a substantial increase in the cost of the plant. Hence the cost of fuel and the operating load factors expected over a period of years will have a vital influence on design. Where the load factor and fuel costs are low it does not pay to design for the best possible thermal efficiency. The expression "dollar efficiency" referring to the plant performance which will give the lowest over-all cost of energy per kilowatt-hour, including both operating and fixed charges, is coming to be a generally used term.

Economy data covering one year's operation of ten representative plants for pressures from 310 to 1,200 lb. show lower heat consumption for the higher pressure stations, but there is a greater tendency on high pressure to scale formation and more attention must be given to feed water treatment. The increased use of evaporators with and without chemical treatment is reported. Air preheaters for temperatures varying from 400 to 500 deg. F. have been installed with good results. An increase in the use of single-pass condensers is reported, notably, in connection with the larger turbine units. A comparison of the amount of condensing surface per kilowatt of turbine capacity shows 0.91 sq.ft. for single-pass condensers as against 1.22 for those having more than one pass.

The use of pulverized fuel, both in utility stations and industrial plants, is increasing rapidly, and high efficiencies and ratings are being reached. A number of units are operating between 200,000 and 300,000 lb. of steam per hour. Automatic combustion control is giving valuable results. Stoker capacities are being increased to meet the demand for heat radiation per square foot of available space. Water-cooled walls are reducing stoker and furnace maintenance cost and slag trouble. Of particular interest is the report on power station betterment which deals with the problem of bettering operating conditions in existing plants, with a view to obtaining maximum results from installed equipment before any additional expenditures are made for improvements.

Progress is reported in the commercialization of certain processes for the distillation of coal, and a number of plants are being located both in this country and abroad. The most notable in this country is a plant near New Brunswick, N. J., operating on the K. G. S. system for the production of lump fuel and gas for domestic use, and tars and oils. The Standard Oil Company of New Jersey has obtained the American rights for the Bergin's process covering the production of synthetic petrol.

WATER POWER STUDIED

The hydraulic power committee has been giving special attention to the problem of forecasting water supply and important results have been obtained. While definite conclusions are not yet available, some of the methods used are showing surprising accuracy and it is hoped that they will soon be developed to such a degree of reliability as will make practical definite forecasting of water supply at least for short future periods. Water-wheel testing has also received intensive study. The value of maintaining accurate measurements of water

**Abstract of address before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

consumption is emphasized and new methods have been developed whereby such measurements can be obtained at practically any installation.

Recognizing the necessity for advanced planning of system development, the electrical apparatus committee has set up a sub-committee to deal with the fundamental planning of systems. Last year a tabulation of preferred system voltage ratings was published and a survey is now under way to determine to what extent the proposed voltages are in use or acceptable. This subject is now in the hands of a joint committee with the National Electrical Manufacturers' Association, whose business it is to submit definite recommendation for standardization of system voltages. This step will logically follow that made several years ago when standard utilization voltages were established.

The interconection of major power systems has continued to progress during the year. The definite advantages of interconnection are coming to be more clearly recognized to be increased reliability of service and more efficient use of generating capacity installed. Interconnection is not resulting in transmission of power over long distances, but is rather making it possible for adjacent systems to utilize each other's facilities to mutual advantage. While the economies of interconnection represent a large amount of dollars all told, it is probable that they do not bring to the companies to which they are available a saving in overall cost of power of more than 3 per cent to 5 per cent.

There are now twenty alternating-current low-voltage networks in operation. This type of system provides higher grade service for densely loaded urban areas at a substantially lower cost than is possible by other methods, and is accordingly coming to be recognized as the standard method of alternating current distribution for dense loads. A comprehensive study of motor operation on networks in service indicates clearly that there is no necessity for the development of a new line of 200-volt motors for network use. The starting of large motors on networks is being taken care of by step starters which provide for building up the starting current by definite ampere steps at definite time intervals.

The problem of short circuit interruption is still in the foreground, and while improvements in design have brought about better performance of circuit breakers, this situation is still far from satisfactory. An intensive investigation of the oil circuit breaker problem has been undertaken by a special committee of the Association of Edison Illuminating Companies. The Engineering National Section is participating in this investigation through official representation on the Edison's Association committee.

A special committee on system testing of oil circuit breaker interrupting capacities has developed a standard testing procedure and three major companies have already completed series of tests under this procedure. Comparisons of test results on different systems are thus possible.

The problem of short-circuit control also is being approached from the angle of definitely limiting the maximum values of current through system design. One of the most interesting principles employed is the paralleling of various generators through remote substations instead of over the bus in the station in which they are located, thus interposing line impedance between units.

Two field investigations are under way relating to the behavior of insulating oil in service in transformers and oil circuit breakers, one dealing with handling and treating methods and the other with oil deterioration. It is expected that much needed experience data will be obtained which should result in substantial improvements in methods of handling oil.

During the past year manufacturers of motors and all appliances, except washing machines, have agreed with the N.E.L.A. and A.E.I.C. to the adoption after Jan. 1, 1929, of a new line of fractional horsepower motors with substantially improved characteristics as to efficiency, power factor and starting current. The use of the new motors should help materially to solve the problem of voltage fluctuations, particularly in houses not adequately wired.

Temperature Rating Used

Further progress has been made in establishing the principle of total temperature rating of electrical machinery.

The first step was taken when provision was made for increasing the rating of general purpose motors for a temperature rise of 50 deg. C. by multiplying the 40 deg. rating by a service factor. Now, through the efforts of our representatives on the standards committee of the A.I.E.E., it is expected that a basis will soon be adopted for the operation of transformers at loads above the standard rating when the ambient temperature is below the 40 deg. C. standard. Appreciable economic gain to the industry will inevitably result.

The overhead systems committee has centered its activities around an intensive study to determine the best possible design for overhead line structures. A survey of the entire country is being made to determine from actual experience the wind and ice loads to which overhead lines are subjected. The committees of the Geographical Divisions are actively co-operating in this work. Supplementing the results of actual experience, an exhaustive experimental investigation is being carried on at the University of Michigan. A special wood pole line has been erected which is being subjected to a wide range of wind and ice loading. Accurate measurements of the stresses developed are taken and recorded. It is proposed to continue this investigation next year.

A thoroughgoing study of rural line design and construction has been practically completed by the overhead systems committee, which will soon publish a serial report on recommended practices. This will reflect the combined experience and judgment of the best engineers in the country and should become the future standard for this class of construction.

The underground systems committee reports the increasing use on voltages as low as 11,000 of three-phase installations of three single-conductor cables in single large ducts. A comparative analysis of the cost of three 1,000,000-circ.mil single-conductor cables in one duct with three three-conductor 350,000-circ.mil cables in separate ducts, both designed to carry the same load, indicates a saving on the former over the latter of 59 per cent in duct system and 25 per cent in cable. Furthermore, the enormously higher dielectric strength of single-conductor cable as compared with three-conductor cable has been definitely established. Installation of metal-shielded conductor cables are increasing. At the end of 1927 there were 104 miles of this cable in operation without cable or joint trouble, as compared with 22 miles in 1926. Duct sections 1,000 ft. in length are being successfully used, thus effecting a reduction in manhole and joint costs.

K. R. MacKinnon
Chairman Committee on Accident Prevention

A. H. Kehoe
Chairman Committee on Electrical Apparatus

H. P. Liversidge
Chairman Committee on Engineering Administration

Bryon E. White
Chairman Committee on Hydraulic Power

The research into the properties of paper-insulated cable has been continued and further progress made. The purpose of this research is to develop the facts necessary to make possible the writing of specifications which will cover the requirements and tests necessary to assure the purchaser of obtaining satisfactory and uniform cable of this type.

Analysis of operating results on underground cables actually in use show that defective workmanship accounts for the greatest number of joint failures from any one cause. There are five times as many failures in splicing cables due to poor workmanship and poor insulation as there are in the cable itself due to internal and electrical causes. It thus appears that our cable operating organizations are not keeping pace with the improvements of the manufacturers.

J. C. Martin
Chairman Committee on Inductive Co-ordination

The most important activities of the meter committee during the past year have dealt with the training of metermen throughout the country. This committee has fostered short educational courses on meters and metering practices at universities and schools all over the United States. The attendance at these courses has been very gratifying, and the result is bound to be an improvement in the average technique of our metermen. There has also been conducted a number of general group meetings of metermen of the various Geographic Divisions. The attendance at these meetings has been in the hundreds, and much good work has been done. The meter committee is now engaged in the preparation of a correspondence course which will be designed to provide material for the training of new employees as meter testers or to perform other duties in meter departments, and for others desiring a better knowledge of meters and metering.

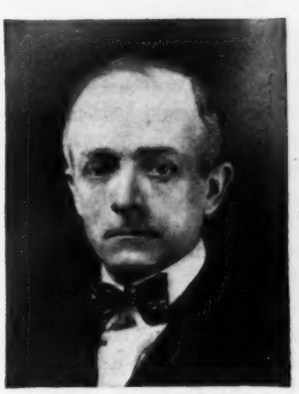
During the past few years the inductive co-ordination committee has performed an outstanding service in crystallizing the basic problems of inductive co-ordination with the communication circuits and in training the engineers of member companies on this important subject. The committee has also served as an advisory staff to assist in directing the field surveys in the development and research program carried on by headquarters engineering staff.

Practical solutions are now being obtained so that situations involving inductive co-ordination can be worked out on the basis of the physical facts involved rather than on theory.

It is worthy of mention that recent meetings of the development and research committee have been outstanding in that discussions of work done and under way predominated, whereas in previous meetings the discussion had centered about work that should be done. The entire picture was one of a grasp and understanding of the work as well as of actual accomplishment that has not heretofore been so evident. Engineers of headquarters staff trained in these problems are available at the call of member companies to make field studies of conditions existing in specific troublesome cases.

E. E. Hill
Chairman Committee on Meters

Harold Cole
Chairman Committee on Overhead Systems



E. B. Ricketts
Chairman Committee on Prime Movers

J. W. Sylvester
Chairman Committee on Underground Systems

The problem of voltage regulation at the customer's service is demanding more consideration as the practice of combined light and power circuits develops and the variety in types and characteristics of utilization apparatus increases. Voltage regulation is a very important factor in over-all distribution system costs. It has been generally held that incandescent lamps require very close voltage regulation and in many systems no expense has been spared to maintain a very narrow voltage range on the circuits carrying lighting service. Actual experience indicates, however, that such close regulation is scarcely justified and a trend toward broader regulation is noted in order to bring about a reduction of distribution cost.

The voltage regulation problem involves two factors: First, the maximum and minimum range of voltage, with the gradual variation between these limits as determined by magnitude of load, length of line, size of wire and voltage impressed; second, quick fluctuations in voltage which are caused by the operation of individual pieces of apparatus, as for example the starting of motors. The solution of the problem by improving system regulation is the most costly in many cases.

A specific case at hand where there is a tendency to demand unreasonably close regulation is found in the alternating-current radio sets now coming into general use. On account of the sensitiveness of the alternating-current tubes to voltage variation, considerable expense and complication is required in the design of sets of this type to meet the wide range of service voltages throughout the country. Nevertheless, it is unquestionably a fact that the cost of providing for this range of voltage in the radio equipment is insignificant compared to what it would cost the power industry to provide all over the country service voltages within a sufficiently narrow range so that regulating equipment would not be required on the radio set.

Future Conditions

Looking forward to future conditions, the trend of which is clearly shown, emphasis is placed on the necessity for "more system capacity per dollar of investment" because of the increasingly important part that fixed charges are playing in the total cost of electric power service. Heretofore a major factor in the economies that have taken place in the power industry has been improvement in the efficiency of fuel consumption. Now, however, the cost of generation has become such a small part of the total cost of service that it is necessary to look elsewhere for further major economies, and the system investment offers the greatest field of opportunity in which to find them. In the past attention has been centered in reducing fuel and other operating costs. In the future it will be devoted particularly to economical system design and control of construction costs.

It is inevitable that the power industry will spend more money in the next ten years than in any past like period. It will be called upon to meet more exacting service requirements than ever before, and will be under greater economic pressure so that more careful attention will have to be given to every dollar spent. These are the engineer's problems and are more difficult than those which have confronted him in the past. There is therefore an important executive problem to be worked out in recruiting and training the necessary engineering talent and in providing an organization to enable it to adequately function. To meet these more exacting requirements the engineer must develop himself into a "scientific business man." His job starts with getting solutions to the physical problems but by no means ends there. He must be a good business man, a salesman, a diplomat and "must play with the team" if he is to deal successfully with those men with whom he must deal if his plans are to materialize. Just to the extent to which he anticipates executive judgment, which must be based on organization, commercial and public relations viewpoints as well as on engineering, to exactly that extent does he become a more valuable man to his company and himself, and put himself in line for bigger things.

Codes and Standards*

By Irvin W. Day
Chairman Codes and Standards Committee

OUR obligation to the public in the supply of a necessary service requires that we weigh with impartiality and a fearless devotion to our public trust the fixing of rules and the adoption of standards for the conduct of our business. We want wise and reasonable rules—rules that are based on good, sound business economics—rules that have always the best interests of the public at heart. Therefore, having in mind the final costs, in the rendition of our service to the public and for which we in the end are responsible, it is necessary that we follow most intimately the formulation of codes and the adoption of standards for the conduct of our business.

The work of our committee during the past year has been largely concerned with co-ordinating the activities of the N.E.L.A. with the work and activities of other associations or groups. Harmonious relationships have been established and effective work started toward the elimination of confusion in standardization matters. Much wasted time and effort are still caused by the multiplicity of standardizing agencies. Attention was called to this situation in our report last year. There appears to be a wholesome desire on the part of every one to simplify standardization procedure, but prestige, brought about through years of contact or control, is perhaps the greatest barrier to real progress. While the light and power companies are not standardizing agencies and have no direct responsibility as such, their interests and those of the public they serve are indirectly affected by everything that is done along these lines. They are perhaps more directly affected by formulation of codes and should take a serious interest in their development.

We desire to bring to the attention of member companies the importance of recent code developments. We earnestly recommended that the executives of the member companies impress upon their engineering and operating organizations the necessity of becoming familiar with both the safety and fire codes as well as the various other codes which affect construction and operating methods of the power companies. Lack of interest or lack of familiarity with these matters may involve the expenditure of large sums of money by the power companies, and it is most important that each company designate some one in its organization to follow particularly matters relating to codes. It would be well that N.E.L.A. headquarters be advised as to the person so designated to the end that closer co-operation may be established between association headquarters and the member companies on matters affecting new codes as well as the revision of existing codes.

**Report presented at N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

National Engineering Work*

Why a headquarters engineering staff is needed. Work of staff outlined. Relations with other organizations. Progress notable

By H. S. BENNION
Director of Engineering N.E.L.A.

THE National Electric Light Association had been organized thirty-five years before an engineer was placed on its staff. This happened about eight years ago. Today it has seventeen engineers, and these are spread out rather thin over the field they are supposed to cover.

The question arises as to why, after getting along thirty-five years without an engineering staff, the association should need such a big one now. There are two primary reasons for this. The first is that physical developments in the United States in recent years have expanded so greatly that the various elements bump into each other much more persistently than they used to. This is the case on the surface of the ground, underground, in the air and in the ether. We have not the elbow room we used to enjoy. Fields of interrelation and interdependence have multiplied. In the past five years the expansion of our electric plant and equipment has equaled the total growth of the preceding forty years.

H. S. Bennion

The second reason for the engineering staff is to be found in the recent and rapid growth of other organizations, particularly national organizations of an industrial, technical and governmental character. The federal government alone has added some eighty-five bureaus, commissions and boards in the past twenty-five years. According to the Domestic Commerce Series of the Department of Commerce and reports of the National Research Council there are about 1,500 trade associations in America. There are 120 important technical and scientific associations and some 600 small and highly specialized organizations of this character. I have taken no account of civic, political, patriotic and religious societies, though any of these may undertake work having an important bearing on the development of the electric light and power industry. There are also many corporations of national scope, such as the American Telephone & Telegraph Company, the Western Union Telegraph Company, etc.

The building up of our staff has lagged a goodly distance behind the parallel development of these other organizations and behind the growth of the business we serve. To our credit, or perhaps to our discredit, we have not taken the initiative in furthering national work of this character. We have rather consistently waited to be pushed by the force of circumstances into more work. The appointment of an engineer to serve on the headquarters staff came years after the large and efficient Bell Telephone systems had become seriously concerned with inductive interference. Even today our force of twelve engineers devoting itself to the joint research and development program of the N.E.L.A. and Bell Telephone systems is small compared to the force of the American Telephone & Telegraph Company devoted to the study of this joint problem. Inductive co-ordination work undertaken jointly with the Western Union Telegraph Company adds to the task of this comparatively small force of ours.

The growth of the movement for standardization and codification and the turning by regulatory bodies toward the development of specificational rulings governing the public utilities has been the second important factor in contributing to the size of the engineering staff.

A third factor has been the administrative burden coming to the officers of the Engineering National Section and its committees as a natural result of the size of the association and of its consequence in the world of affairs. As I stated before, our physical structures have doubled in extent in the past five years, and this may be taken as a measure of the corresponding increase in our importance to the general welfare.

**Address, "The Purposes and Accomplishments of the Engineering Staff," before the N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

The fourth factor in contributing to the job of the engineering staff has been the demand for more research and survey work by the association. To date this demand has generally come to a head when relations with other organizations disclosed the need for certain specific information.

The foregoing are the major reasons for the engineering staff. Developments such as radio, aviation, etc., have just added so much to the job.

Joint Work Basic

The inference could well be drawn from the foregoing that we have strengthened our organization for purely selfish purposes; that each time we saw our interests seriously threatened we have built up the home guard to drive out the invader from our preserves. While it is true that there is this element in the development of our engineering staff, it is the minor element. As a matter of fact, we have organized to take on additional work as it has become patent that such organization on our part was badly needed in the general scheme of things. The product which we generate and distribute has become the lifeblood of the country. It is an indispensable or extremely important factor in most of the activities of the various important elements of the entire nation. Our physical structures occupy large areas and have characteristics of great moment to others. The telephone companies do not now and never have feared our organizing to tackle the inductive co-ordination problem. They have welcomed it. They hoped for such action on our part long before we acted. They have appreciated very clearly for a long time that in a field so technical and intangible real progress could only be made through co-operative effort and that the better organized we were in this respect the more able would we be to co-operate.

And who loses by such co-operative effort? No one does. The benefit is general. The two utilities directly concerned gain by this process because they are left just as free to reach their customers and to sell their respective services as the natural laws of induction will permit. They avoid the unnecessary losses which are bound to occur where artificial barriers or arbitrary conventions are imposed by an outside referee. The state regulatory bodies are relieved of the thankless task of laying down arbitrary rules governing a highly complex relation. The courts are freed from endless technical testimony and, most of all, the public is served without long delays and at a minimum over-all expense.

The importance of standardization and simplification to the general welfare of the country is so well appreciated that elaboration on the point is not warranted. It sometimes is not appreciated, however, that real progress in standardization is not made by fiat, law or arbitrary ruling, but only by co-operative and diligent effort on the part of all important parties concerned. Particularly is this true in the highly technical fields. The concerted effort of the electric light and power industry in developing electrical standards represents an enormous contribution toward the public good. This work could scarcely be accomplished without our organized assistance. Our expert technicians who devote in the aggregate countless man-hours to this particular work render a great public service, and this service is just as important to the public welfare whether they are furthering a sound proposal or opposing an unsound or premature standard.

In the fields of safety affairs the same general statements are equally true. Real progress in minimizing fire and casualty hazards resulting from the use of electricity can only be had with the help of an organized electric light and power industry. The co-operation of the engineers who design and install power generating and distributing plants, who establish the operating methods of the large systems, and who train and direct the operating personnel is essential to any safety program, not only in the development of codes, regulations and ordinances but in the further extension and perfection of the arrangements for preventing fires and accidents. The establishment of rules and requirements without their initiatory and helpful participation is bound to result in ineffective, possibly dangerous and unnecessarily burdensome requirements. The public will not be well served. It probably will not be adequately protected in important parts, and it will be unnecessarily burdened by other specifications.

This general elaboration can be shortened by stating that in the modern scheme of things the organized effort of each important industry is essential to the efficient promotion of the public welfare.

Joint Work Slow But Important

In the carrying out of an extensive joint development and research program it is only natural that there should be a long interval between first obtaining the information in the field and the final issuance of a mutually acceptable report to the industry. The latest research data are, however, being applied rather generally throughout the country for the solution of inductive co-ordination problems through the participation of our staff engineers and those of the American Telephone & Telegraph Company in the handling of current cases. This knowledge is also made available and put to use through the large number of power engineers serving on the joint development and research sub-committees and on the inductive co-ordination committee. In other words, we are now cashing in on our research work and have been for some time. To a considerable extent, we have a working knowledge of this particular relationship.

In co-operating with the sub-committee on loading and strength of aërial lines the staff has contacted with the Weather Bureau stations and with a number of member companies throughout the country in furtherance of the program for obtaining records of glaze storms. A staff engineer covered parts of New England and the Middle Atlantic states in collecting records of the older pole lines. Contact was also maintained with the experimental work which is being conducted at the University of Michigan as a part of this general research project, to facilitate the procurement of instruments which can be used in the work.

At the request of one of our larger member companies, we have collaborated in the specification to accompany a joint use contract. This agreement, as I understand, is now being put to use between the companies of the Bell System and the subsidiaries of this power company. The specifications are available for the information of other companies. It is hoped that after a trial of two or more years this agreement and the specification may serve as a basis for action in this field by the joint general committee.

It seems to me most desirable from the standpoint of efficient public service in the whole utility field that so far as possible the utilities should work out among themselves the specifications governing their respective joint

relations and that regulatory requirements and codes covering these matters should be confined to statements of principles and to the laying down of general rules. This makes for flexibility without sacrificing safety and permits keeping construction practices closer abreast of the advancing knowledge of the art. To bring this about the utilities must demonstrate that they are able to govern their inter-relations to the benefit of all concerned, particularly to the benefit of the public. When we have made this demonstration, we can then ask for the elimination of specificational matter from national codes and from state rules. Should this be effected, the necessity for frequent revisions of codes and state rules would be largely eliminated.

During the year we have participated in hearings before state commissions engaged in the formulation of regulations governing overhead construction in Maine, Iowa and Idaho. My assistant, Mr. Campbell, through familiarity with the provisions of rules in a great many states and through his intimate knowledge of the Safety Code and of the viewpoint of the other utility services in the fields of joint relations, can be of great assistance in the formulation of state rules and, in my opinion, can render an important public service in making his broad knowledge of this particular subject available throughout the country. This endeavor aids in the development of sound rules since profit is had from the experience of others.

We have assisted the oil burner sub-committee of the general merchandising committee in making a survey of the extent of use and the characteristics of the oil burner. We hope to assist in more such surveys. Our industry must take a leaf from the Gas Association and conduct research projects in the field of utilization to determine with more precision the fields of use for our product and the limits within which it can successfully compete with other products. These are matters of concern to the engineer as well as to the sales force. Our industry must keep abreast of the times in getting business.

We have assisted the special committee on the marking and lighting of airways with a view of keeping the industry informed of the developments in that field and in an effort to aid the Department of Commerce in its desire to obtain central station power for airway beacons and for landing fields. A survey was made of the experiences of a number of member companies in furnishing such service and in dealing with the problems presented by the developement of airports at the larger towns and cities.

Codes and Standards

In the field of codes and standards we have been particularly active. My assistant, Mr. Maxwell, has made it a point to cover all meetings of the American Engineering Standards Committee, of its electrical advisory committee, of the electrical committee of the National Fire Protection Association and to attend meetings of the larger inspectors associations. In addition, we have participated in numerous miscellaneous meetings and conferences where code matters were involved.

With the present state of organization in the field of standardization, as pointed out at the beginning of this talk, it becomes mandatory that our association have a message center, so to speak, to which all the latest information of what is going on in the field of codes and standards is reported. This center must also be a historian's office from which the continuous record of any standardizing movement can be had. This need my office has been directed to fill. Since it is being depended upon for this purpose, it becomes more and more essential that individuals and committees engaged on standardization projects keep headquarters posted on developments relating to their assignments.

I need not enumerate here the machinery set-up and the procedure adopted by our association for handling its share of the standardization load. Suffice it to say that there are 150 current standardization projects in which we are participating. I should like, however, to call your attention to one point that those of you who have not seen hard service in the standardization mill may overlook. Our association machinery is big and slow moving. As an industry we are notorious for having divided views on questions—technical and policy. Among the numerous standardizing bodies it frequently happens that certain of the projects are moving comparatively fast. Our association must act quickly or forever hold its peace. We on the staff in our rôle of maintaining routine contact are like sentries on outpost duty and frequently must decide whether there is time to call up the main body to attack the question at issue or whether we ourselves must engage it with the limited force at hand. In other words, it often happens that we must take the initiative, procure an answer quickly and give it authoritatively, sometimes making commitments of importance on our own responsibility. These are emergency actions and I call attention to them because our motives might be misunderstood and because their occurrence emphasizes the desirability of keeping headquarters posted in matters bearing on codes and standards so as to reduce the chance of our giving the wrong answer in such a situation.

In addition to the foregoing general tasks, which we have with us more or less all the time and which form the main grist of the work of the Engineering Staff, there are multifarious duties that come to hand from many quarters. These are too numerous and too fleeting in character to warrant enumeration. Since engineering forms the foundation of our business, it goes without saying that there are points arising from time to time upon which engineering comment is useful to management. Our rule of conduct on the Engineering Staff is to make ourselves generally useful by contributing wherever possible to the common good.

Essentials of Industrial Relations*

By Homer E. Niesz

CONTACTS with the individual customer occurring at best but a few times a year, and including all the elements of personality, may easily create bitter hostility, irritation, passing satisfaction or even occasionally lasting enthusiasm, depending upon the character, intelligence, appearance, manner and genuine desire to serve which the employer manifests. These statements, emphatically true of face-to-face contacts, are, in a modified but an equally important degree, also applicable to contacts by correspondence and by telephone. Improved performance, it would seem, can only result from specific training, critical supervision and regular measurement of personal service given. These three lines of advance require full recognition of the supervisor's responsibility for training in his group.

**From report of customer relations committee presented at the N.E.L.A. convention, Atlantic City, June 4-8 1928.*

Government in Industry*

Lax public interest in government produces critical business reactions. Obligations of industry and of government

By JOHN E. EDGERTON
President National Association of Manufacturers

John E. Edgerton

WHAT has been taking place in your particular industry and in the general field of public utility is only an acute local manifestation of a general tendency of government. It is a cutaneous outbreak of an organic disease on our political body. This malady was prophetically diagnosed twenty-five hundred years ago by a wise Chinese philosopher who said: "As restrictions and prohibitions are multiplied in the empire the people grow poor and poorer. When the people are subjcted to overmuch government the land is thrown into confusion. When the people are skilled in many cunning arts strange are the objects of luxury that appear. The greater the number of laws and enactments the more thieves and robbers there will be. Therefore, the Sage says, 'So long as I do nothing the people will work out their own reformation. So long as I love calm the people will right themselves. If only I keep from meddling, the people will grow rich. If only I am free from desire, the people will come naturally back to simplicity. If the government is sluggish and tolerant, the people will be honest and free from guile. If the government is prying and meddling, there will be constant infraction of the law. Is the government corrupt? Then uprightness becomes rare and goodness becomes strange. Verily, mankind has been under delusion for many a day. Govern a great nation as you would cook a small fish—that is, don't overdo it.'"

Even his most unforgiving enemy or unsparing critic cannot say truthfully of the President of the United States, Calvin Coolidge, that he has been noticeably lacking in that rarest of qualities in public life today—courage. Whatever other judgment history may pronounce upon him, if it be true to its purpose of unimpassioned record of fact it will say that no servant of the people of the United States was ever more consistently courageous in resisting the encroachments of federal government upon the prerogatives of its citizens. When he was Governor of Massachusetts he was moved by his observations of tendencies in that state to say that "the alternative of private ownership and control is public ownership and control. Broadly extended this is communism."

As a matter of fact, gentlemen, there are extremely few people in America today who are willing to admit their belief in the principle of government ownership and operation of the instrumentalities of production and distribution. On the contrary, most of those who are lending themselves to the enterprises of socialism either through non-resistance or active connivance are loudest in the repudiations of socialistic purpose. They are wearing the cloaks of Republicanism, Democracy, Progressivism and other political regalia. Practically every legislative body in the land from the board of aldermen or commissioners of the smallest town to the Congress of the United States has in it members under one name or another who are constantly looking for opportunities to project government into that territory of competitive private enterprise for which it was never intended by our fathers.

Then there are others in the same bodies who have not enough information, understanding or intellectual energy to offer effective resistance and who thus become the unconscious tools of selfish leaders. Outside of but tangent to this circle of political privilege and opportunism is another which includes, besides the usual motley elements of communistic hybrids, an army of retired or retiring millionaires and the widows of others who obtained their wealth in many instances through dubious processes and are now helping to sustain the forces that would wreck free government. Verily, of all the trusts that menace the future of our country today the political trust looms as the most sinister; and in this intemperate day of inquiry into the affairs of others it is high time that the people should get together and appoint a committee to investigate it.

PUBLIC INTEREST IN GOVERNMENT

Only a renaissance of patriotic interest in government, on the part particularly of the better informed and more responsible elements of American society, can accomplish the needed reforms. It can not be done merely by organized denunciation and protest, for this is the

**Abstract of address before N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

known common resort of those seeking refuge from the condemnations of a consciously guilty record. And upon none does the obligation of leadership in the restoration of constitutional government fall more heavily than upon industry and its controlling forces; for not only is it always the first and greatest victim of bad government, but those who guide its destiny have an equipment in experience and understanding which peculiarly qualifies them for the tasks of good citizenship. To lead successfully in any constructive work, however, it is necessary to wear the impenetrable armor of a clean record. A soldier conscious of secret disloyalty to the aims of his belligerency lacks inevitably the courage without which effective fighting is impossible.

We all know that there are in the industry and business some who are unscrupulous in their methods and practices, preying upon public confidence and plundering helpless people. That is as undoubtedly true of my branch of industry and the others as it is of yours. There is no advantage in refusing to recognize a fact so obvious. On the contrary, the sooner the honest majorities of the organized trades not only recognize but meet it with vigorous and unmistakable disapproval, the easier it is going to be to get government back into its proper place. All too long have industry and business shielded their crooked actors by furnishing them harbors of safety in their organizations and by failing to establish and maintain codes of ethics through the impartial operations of which the black sheep may be distinguished from the white. This situation supplies to ambitious government and designing politicians all needed excuse for their pestiferous inquisitions. It is the unconscionable few who thus bring embarrassment, inconvenience and sometimes destruction to the innocent many. At this point lies the richest opportunity which the trade organizations have for service both to themselves and their country. Let them devise methods of handling their own prodigals and thus remove even a seeming necessity for government intervention.

Then, too, if you will examine the record carefully, you will discover that in many if not most instances government has got into industry and business largely upon its own invitation. It is not an uncommon occurrence to see in Washington and at other seats of government groups of industrialists and business men actually petitioning government to extend its powers and functions, to establish this board or that, or to interfere here or there with the business of somebody else. The average trade or business organization is usually concerned about what the government does or does not do so long as it does not pester that particular group. On the other hand, it is wont to rejoice in the discomfiture of a competing group even if such occasion of joy weakens the general position by impairing a principle upon the maintenance of which the security of all depends. Government is quick to sense and take advantage of such opportunities of disunion, and by playing group against group it nullifies resistance to its advances in the ostensible interest of the common good.

Finally, there is no way to cope successfully with organized error except with organized truth. It is true that wars of defense and for righteous principle are sometimes even more expensive than wars of offense and aggression. That is especially true with wars waged upon an industry by government. Not only do the innocent parts of that industry suffer, but those of all others eventually share the harmful consequences. In the present circumstances, therefore, when the instinct of legislative investigation is so manifestly aroused and government is so obviously bent upon competitive engagements with its citizens, it is the clear duty of all industry and business to share the burdens of common defense against unjust and unnecessary attack. In the meantime, and as security for the future, every trade and business organization should clean itself where necessary and should so live that when its summons comes to join the innumerable caravan which moves to that mysterious committee room in the boisterous halls of Congress it go not like a quarry slave at night scourged to his dungeon, but, sustained and soothed by a clear conscience, let it approach the seat of investigation like one who wraps the drapery of his couch about him and lies down to pleasant dreams.

Private Ownership Gives Service*

By Franklin T. Griffith
President Portland Electric Power Company

THERE is no general accusation that our statements supporting the cause of private ownership and operation are untrue, but we are specifically charged with spending large sums of money for the purpose of creating favorable public sentiment on behalf of private operation. In the minds of proponents of government ownership this practice of ours is deemed highly reprehensible, and our right to use any portion of our revenues in placing our cause before the bar of public opinion is questioned.

We believe that the cause of public service in its broadest aspect can be best served and the development of the industry promoted by giving full play to inventive ingenuity, to constructive financing and to sane and logical extension of the use of the service we give. We believe these activities would be stifled under political ownership and management, and we also believe they can be brought to the highest pinnacle of success only by that plan calculated to bring to the highest degree of perfection the capacity and ability of the individual. We advocate no new principle in this regard, but we stand four-square on the fundamental principles of our government. An attack upon the principles for which we stand is an attack upon our government itself.

This government was never formed or intended to function as a business organization except in so far as business necessarily is involved in government. We are against socialism and we are unalterably opposed to communism. We are, in our corporate and individual capacities, citizens of the United States. The right of free speech belongs as much to us as to any other group of citizens. We do not object to the dissemination of views differing from ours, but we most strenuously do object when such different views are bolstered and supported by plain misstatements of fact, and I insist that when we challenge misstatements of fact made by those who would plunge the nation, the states and the municipalities into the dark pool of political operation, we are doing that which is not only our right but our duty as citizens as well as representatives of the industry of which we are a part.

**Abstract of address, "The Clearing House of the Industry," before N.E.L.A. convention, Atlantic City, June 4-8, 1928.*

News of the Industry

Forty-five-Million-Dollar Hydro Plant Planned

New Move Made in Development Projected on Upper Connecticut River at Fifteen-Mile Falls by New England Power Association

PERMISSION to build a hydro-electric development on the Upper Connecticut River to yield 220,000 kw. from the stretch known as Fifteen-Mile Falls in the district between St. Johnsbury, Vt., and Littleton, N. H., was sought in a petition filed on June 1 by the Grafton Power Company with the Public Service Commission of New Hampshire. The New England Power Association is the parent company in the project, which was noted a year ago by the ELECTRICAL WORLD as in contemplation and which is one of the largest ever undertaken in the East. At this writing it has not been decided whether the construction work will be begun this summer or not, as certain negotiations in progress remain to be satisfactorily concluded, should a favorable decision be rendered by the commission after hearing the petition.

The Fifteen-Mile Falls development will represent an investment of approximately $45,000,000. About 330 ft. of fall in the river is embraced in the scheme, which has been receiving extended engineering study for some years past. To a representative of the ELECTRICAL WORLD President F. D. Comerford of the New England Power Association stated that if the project is carried through as planned, it will be handled as a single comprehensive development rather than as a small-unit piecemeal program. A hearing has been set for June 27 at Concord, N. H.

Supply Jobbers Change Their Name

Will Henceforth Be Known as the National Electrical Wholesalers' Association—E. Donald Tolles Is Made Managing Director

AT ITS twentieth annual convention, held at Hot Springs, Va., this week the Electrical Supply Jobbers' Association unanimously voted to change the name of the association to the National Electrical Wholesalers' Association. At the same time E. Donald Tolles, who has served the association for many years as its executive secretary, was appointed managing director.

George E. Cullinan of the Graybar Electric Company, the chairman, in his opening address on Wednesday morning said that the jobber was not sick, but that he had his problems, which were caused mainly by rapidly changing conditions in the business. He also said that the greatest current misconception of the jobber was that he buys and sells instead of acting as a distributor and warehouseman, which was his actual function. Another misconception was that the jobber does not do a promotional job. This was refuted by Mr. Cullinan, who also pointed out that selling methods depend on the type of products.

H. T. Bussman, vice-president of the Bussman Manufacturing Company, St. Louis, spoke on Wednesday evening on what is to be gained by the four branches of the industry through co-operative effort as provided under the Industry Sales Conference. Mr. Bussman expressed the belief that the conference would do something which no one association in the industry or no one member could accomplish alone. Summed up in one sentence, he said that the four branches of the industry could co-operate to lay the groundwork for a bigger and better business.

An equalization of dues reported and adopted by the association will reduce the cost of membership to more than 90 per cent of its members. The association also voted to support the Industry Sales Conference in making its proposed survey preliminary to the formulation of a plan of procedure.

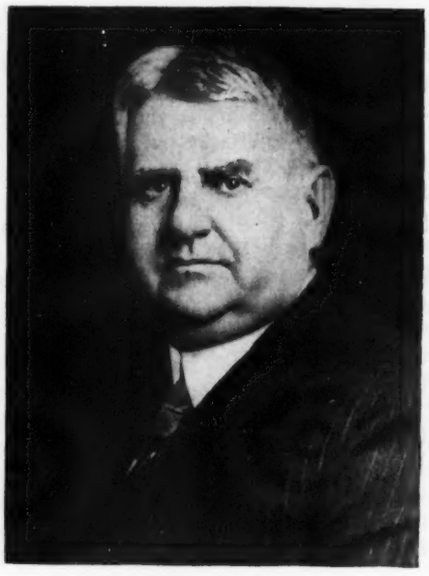
On Thursday evening O. H. Caldwell of the Federal Radio Commission spoke on the radio situation. A demonstration of talking movies, using the Western Electric sound projector system, closed the session.

The following have been elected members of the executive committee of the association:

H. O. Smith of Akron, J. A. Duncan of Chicago, G. H. Wahn of Boston, E. J. Coyle of Philadelphia, L. T. Milnor of Cincinnati, chairman of the Central Division; W. E. Robertson of Buffalo, chairman of the Atlantic Division, and A. J. Cole of the McGraw Electric Company, Omaha, executive committeeman at large.

Public Service of New Jersey Celebrates

Twenty-fifth Anniversary of Company's Formation Marked by Banquet at Newark—Leading Men in Various Pursuits Praise Its Achievements Under T. N. McCarter



Thomas N. McCarter

BEFORE a representative gathering of men prominent in the public, professional, business and industrial life of New Jersey and outside that state, the Public Service Corporation of New Jersey celebrated its twenty-fifth anniversary at the Robert Treat Hotel in Newark on June 1. Co-operation between the Public Service Corporation and the public was the keynote of the many congratulatory speeches made at the banquet. More than six hundred men heard from the lips of Governor A. H. Moore glowing testimony to the value of the Public Service Corporation in the development of the State of New Jersey. He referred to it as an institution, rather than a corporation, which has become part and parcel of the state.

Thomas N. McCarter, organizer of the corporation and its president since formation, was the toastmaster. He painted a wonderful picture of the future greatness of New Jersey and of the opportunities lying before the Public Service Corporation. The utterance that received the greatest acclaim, however, was Mr. McCarter's announcement "that in recognition of the long and loyal service of those who have served the corporation and its subsidiaries twenty-five years (some 750 in number), and who as a result wear the Public Service gold button, the board of directors has directed, as of this day, a payment to each of these employees of 10 per cent of their year 1927 compensation."

Mr. McCarter did not dwell at great length on the accomplishments of the corporation during the quarter century of its existence, choosing to let the record speak for itself. "While it is

pleasant to look back over our accomplishments," he said, "yet our eyes are fixed upon the future, not the past. New Jersey is not in the twilight of its life. It is rather at its sunrise. New Jersey has just commenced to grow." He visioned the day when there will be a vast community between the Hudson and the Delaware Rivers, when every steam railroad will be electrified, when gas will be the fuel used, when every portion of the state will be interconnected electrically, and when the Public Service Corporation's system will be tied in with the large power systems of New York and Pennsylvania.

How much of that development he himself would see Mr. McCarter did not know, but he said: "While I am charged with my present responsibility, the flag with which we started, bearing the same old legend, 'To develop the State of New Jersey and to make it a better place in which to live,' will remain nailed to the Public Service mast to be seen of all men."

In congratulating the organization, its stockholders and the public in general on the achievements of the first twenty-five years of Public Service, Owen D. Young, chairman of the board of the General Electric Company, declared: "Full meed of credit should be given the men of imagination of Public Service who at its inception were looking forward with courage, self-sacrifice, determination and supreme confidence. Imagination means the leadership of the world."

Similar sentiments were expressed by A. W. Thompson, president of the United Gas Improvement Company of Philadelphia, and by Edmund W. Wakelee, vice-president of the Public Service Corporation in charge of law.

Besides the toastmaster and other speakers at the head table were Senator E. I. Edwards, Joseph F. Autenreith, president of the State Board of Public Utility Commissioners; John B. Miller, chairman of the board of the Southern California Edison Company; Samuel T. Bodine of the U. G. I. Company of Philadelphia, and Edward T. Stotesbury of Drexel & Company, Philadelphia. Among the guests were a number of prominent public utility men from nearby states.

While the dinner was the overshadowing event of the anniversary celebration, a number of other features formed part of the occasion. Every office of the Public Service Corporation throughout the state was appropriately decorated with flags, and a short time before an oil portrait of Mr. McCarter was unveiled in the directors' room in the Newark terminal.

Among the records of the Public Service Corporation the following are of interest. Since its inception the company has expended more than $300,000,000 in improving and extending its electric, gas and transportation facilities. It has paid in taxes more than $105,000,000. It has increased the number of its stockholders from a few hundred to more than 74,000 in 1927. It has increased the number of electric customers more than 42 times. It has increased its annual electric sales by more than 57 times. It has built an industrial power load from virtually nothing to one representing more than 60 per cent of the entire industrial load of the territory served. It has made far-reaching reductions in rates and at the same time has increased its annual revenues by nearly seven times.

Since 1903 $163,000,000 has gone into additions to and extensions of electric facilities. The generating capacity of the system has been increased more than sixteen times; fourteen old stations have been scrapped and five new stations have been built. Approximately twenty thousand persons are at the present time employed by the company.

Gadsden Answers Attacks on Utilities

Chairman of Joint Committee's Executive Body Deprecates "Premature Conclusions" and Defends Companies' School and Other Literature

THROUGH the office of the Joint Committee of National Utility Associations, Washington, the following statement with regard to alleged use of the schools for private utility company propaganda and the companies' literature in general has been issued for publication by P. H. Gadsden, chairman of the executive committee:

"I have attended several hearings of the Federal Trade Commission in its present inquiry into public utilities, and I have noted that some newspapers have drawn what seem to me to be premature conclusions from the evidence so far introduced in the record. For instance, it has been said that propagandists employed by the public utilities have penetrated the educational systems of the country, distributing material unfairly praising the services of public utilities and improperly criticising and condemning public ownership, that textbooks have been written or rewritten by authors subsidized by the public utilities, and that professors have been paid to write the utilities' propaganda into books on economics and civics.

"These characterizations of the activities of the representatives of the utilities are unwarranted by the evidence so far introduced and are basicly untrue. Representatives of gas, electric, street-railway and telephone companies have from time to time made examination of textbooks used in some of the public schools. Incorrect statements relating to the utilities, obsolete material and omissions of essentials have occasionally been found. In some instances also distinct propaganda favorable to government ownership, accompanied by unfair attacks upon the privately owned utilities, was discovered. Such conditions, when noted in connection with the surveys made, have frequently been called to the attention of school authorities and publishers. In some cases the biased material has been eliminated by the responsible parties.

"The charge that textbooks have been formerly introduced in the schools by public utilities' representatives directly or indirectly has no foundation in the evidence taken or in the facts. Utility representatives have no facilities for such an enterprise and would not use them if they had. In many states the public utility companies have been requested by university, college and school authorities to assist in associating the theories taught in educational institutions with the actualities of the business world. The companies have thrown open their plants to visits and inspection by teachers and students. They have given vacation employment to hundreds of young men who plan to enter the business on completion of their education. They have provided talks to students explaining the salient features of their operations. This is an industrial age, and such instruction is essential to prepare students for the conditions which will confront them when they go to work.

"Public utility companies have prepared and furnished to teachers—not to students, as a matter of fact—pamphlets explaining the business of operating gas plants and electric light plants, carrying on telephone communication and operating electric railways. These are instructive and informatory booklets containing historical and technical data and statements of fact as to which there can be little, if any, dispute. These pamphlets should frankly disclose—and so far as I am informed invariably have done so—their origin upon their covers. If a teacher desired to use them in his classes, he obtained them by asking for them. If he did not ask for them, he did not receive them.

"I have not, of course, been able personally to examine each of these pamphlets, but as to those I have seen the standard of accuracy and truthfulness has been highly maintained. Every one will agree that in publications to be used in any manner in the schools controversial matters should be eliminated so far as possible and prejudice and bias strictly avoided. In this respect the pamphlets I have examined will fairly stand the test.

"The investigating agents of the Federal Trade Commission are now engaged in putting the evidence in the record. They are not commenting on it as it goes in or passing premature judgment upon the activities disclosed. Subsequently the commission will sum up the evidence, draw its conclusions, formulate its recommendations and make them public in its report to the Senate. Also, the record itself will be available for general examination, as it is now, from time to time as accumulated. It is hoped that premature conclusions, based on partial and sometimes not unprejudiced presentations in some of the newspapers, will

be avoided so far as possible by the general public.

"As for literature combating government ownership and operation propaganda, this has, of course, been distributed somewhat widely by representatives of the utilities. I do not feel any inclination to apologize for this material. The propaganda on the other side has been enormous and most energetically distributed and circulated. Moreover, private initiative has been the rule in the United States and its results have seemed to justify it as the American system. If the utilities have been able to assist in maintaining the American standard, they are unlikely permanently to be criticised for doing so. The increasing appreciation by consumers and the public of the usefulness of the service rendered by the utilities is the best evidence that private initiative is quite capable of performing the task.

"In Pennsylvania the Public Service Information Committee, in response to requests from county school superintendents, distributed 120,000 copies of booklets. By reason of erroneous inferences drawn by individuals who neglected to obtain complete information, the committee desired to secure a fair and impartial review of these particular activities. Therefore a letter was addressed to Dr. John A. H. Keith, State Superintendent of Public Instruction, requesting that he appoint a committee to review these booklets so that the facts might be established. That procedure, I am informed, is being followed in other states, so that the educational authorities themselves will pronounce judgment upon the material contained in booklets. Dr. Keith has appointed a committee to review the material in Pennsylvania, and I am confident similar action will be taken elsewhere."

Davidson Defends Nebraska Utility Pamphlet

J. E. Davidson, former president of the National Electric Light Association and vice-president of the Nebraska Power Company, has issued a statement to the public in which he says that furore about the testimony before the Federal Trade Commission with relation to a 30-page pamphlet sent to some of the schoolteachers of Nebraska is an effort to make a mountain out of a molehill.

"As a member of the executive committee of our national association I know of the work being done," Mr. Davidson asserts in this statement. "I examined carefully the manuscript of the pamphlet circulated in Nebraska, and no one connected with the industry in the state has any apologies to make for its contents. I challenge any one to point out one sentence of propaganda of any sort within its covers. Surely there can be no poisonous propaganda in telling this interesting story, a plain story written for the sole purpose of acquainting the youth of today with the great servant electricity."

Rocky Mountain Officials on the Stand

Director of the Public Utility Information Bureau and N.E.L.A. Division Secretary Explain Activities Before Federal Trade Commission Investigation

AT THE session of the investigation into public utility companies by the Federal Trade Commission on Thursday, May 31, Theodore J. Grayson, director of evening schools, University of Pennsylvania, took the stand at his own request in order, as he explained, to correct errors in testimony of a previous witness relating to the manner of the establishment in the university of a public utilities course for public utility employees. Mr. Grayson testified that the course, which was begun in the institution about five years ago, was the outcome of a request on the part of the Pennsylvania Public Service Information Committee to the university authorities, that everything was done in a frank manner and that there was no dictation or even suggestion by the utilities as to the manner of teaching the course or the matter to be taught therein. Mr. Grayson had been paid by the Joint Committee of National Utility Associations $250 each for three speeches he had made in which he opposed government ownership and had derived other income for services rendered to utility organizations.

Another witness was the director of the Rocky Mountain Committee on Public Utility Information, George V. Lewis of Denver. This committee now has an annual appropriation of about $18,000, according to Mr. Lewis. The committee is opposed to the Swing-Johnson bill for the development of Boulder Dam, Mr. Lewis said, but it has done nothing against the project beyond "relaying" literature calling attention to what public utility men regard as a menace.

Several years ago, Mr. Lewis testified, a survey of textbooks was undertaken for the committee by Hubert P. Wolfe, a research fellow of the University of Colorado, part of whose salary the committee paid. A report on high-school activities, made after the third year of effort, said that the committee was "rapidly withdrawing from mental circulation the countless counterfeit ideas relative to the public utility business which have been foisted upon the people for so many years by the unfriendly, the misinformed and the prejudiced." Mr. Lewis next identified checks aggregating more than $1,600 which he said had been paid to Prof. W. C. Duvall, of the engineering school of the University of Colorado, for conducting a survey of municipally owned plants for the Rocky Mountain committee.

Mr. Lewis' testimony, continued on Friday and Saturday, further developed that the Rocky Mountain committee was interested in the appointment of a fact-finding committee on the Colorado River project under the auspices of the University of Colorado. Mr. Wolfe had helped in preparing arguments to be made before the board of regents in favor of setting up such a committee.

The witness testified that his committee undertook to combat through local utility managers a municipal ownership movement which it called the "income-warrant menace." This he defined as a financial device intended to induce municipalities to take over public utility plants. He testified that a pamphlet on the subject was distributed through the state, and he identified a report in which he was credited with retarding this movement.

Orville A. Weller, secretary of the Rocky Mountain Geographic Division of the N.E.L.A., testified that the national body contributes about $4,000 annually to the support of the division and that the utilities in Colorado, Wyoming and New Mexico spend from $1,200 to $1,700 on the association. He explained a power survey undertaken by the association recently as being intended to obtain data on the probable growth of its member companies. Denying that its purpose was to show the advantages of private over municipal ownership, he said that it grew out of repeated statements by tourists that Colorado's tremendous power is going to waste. He said that they received this impression from visiting the state during the high-water season.

The Federal Trade Commission will resume its inquiry on June 11, after the N.E.L.A. convention is over. Officials of the Texas and Louisiana-Mississippi information bureaus will be the first to testify, according to the arranged program.

Shoals Bill Not Approved

President Coolidge Fails to Sign Measure Within the Constitutional Time Limit, and It Therefore Cannot Become Law Before Next Session

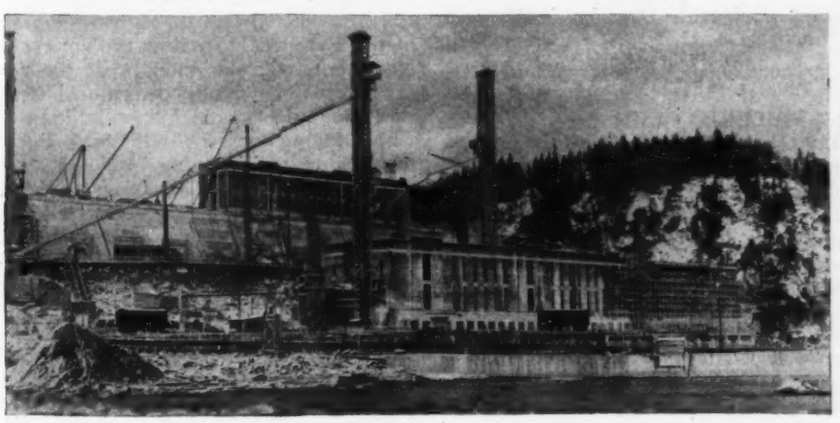
FAILURE of President Coolidge to affix his signature to the Muscle Shoals bill left in his hands by Congress before the expiration of the constitutional ten-day time limit, which was at midnight on Thursday, June 7, has killed the measure for the time being at least, though it can, of course, be repassed and again put before the President when Congress reassembles in December. The "pocket veto" fulfills the prediction that because of the President's consistent opposition to putting industrial functions into the hands of the government, he would not make the bill a law.

Meanwhile, Representative Cannon of Mississippi, former parliamentarian of the House, has stated that nothing but the United States Supreme Court can untangle the difference of view as to the effect of failure of presidential approval between sessions. Mr. Cannon also says that it has been the unanimous opinion in both the House and the Senate, when similar questions have come up, that a pocket veto has no effect in preventing a bill from becoming a law.

First Building at Leaside Under Construction

Ontario Hydro-Electric Power Commission's New Transformer Station Will Handle 220-Kv. Energy Supplied on Contract by Gatineau Power Company

THE first 220-kv. step-down transformer station in Canada is now being built by the Ontario Hydro-Electric Power Commission on a site in the town of Leaside, Ontario, just northeast of Toronto. This station, when completed, will be one of the largest single transformer stations on the continent. Some time ago a contract was made with the Gatineau Power Company for the supply of 260,000 hp. of 25-cycle power, to be delivered to the commission. In order to bring this power from the place of delivery to a point where it could be fed into the Niagara system, two single-circuit 230-mile, 220-kv. transmission lines will be required—the first in Canada at this voltage. One of these lines is now under construction, and, according to a progress report, about 60 per cent of the work has been done and there is every reason to expect that the original time limit set for completion, Nov. 1, will give ample margin. The station site at Leaside, where the line will terminate, covers twelve acres. Energy will be supplied from this station at 110 kv. to the Niagara system and at 13,200 volts to the Toronto Hydro system.



Paugan Falls development of the Gatineau Power Company

The seven oil circuit breakers will be approximately 22 ft. high to the top of the bushing and occupy 45 ft. by 10 ft. each. Each tank, of which there are three per circuit breaker, will require 5,000 gal. of insulating oil. In spite of the large size of these breakers and their heavy moving parts, it is expected that they will completely interrupt the circuit in one-half second.

The transformers are the biggest single-phase water-cooled units yet built in Canada. Four banks will be required to handle the Gatineau contract. The control of all circuit breakers, disconnecting switches, tap changers and synchronous condensers is centered in a room 35 ft. by 45 ft in size.

Active work at Leaside was started a few weeks ago, the first building to be constructed being the erection building required for the assembly of the electrical equipment. This building is fitted with a 75-ton electrically operated overhead traveling crane. It is to be of brick and concrete with structural steel framework. The manufacture of the electrical equipment is well under way at Peterboro, Toronto, Hamilton and St. Catharines. The schedule requires the first portion of the station to be ready to receive power by Oct. 1.

The Paugan Falls plant of the Gatineau Power Company, 32 miles above the mouth of the Gatineau River, in Quebec, rapidly nearing completion, which is designed for an ultimate capacity of 470,000 hp. and an initial output of 272,000 hp., will probably supply most of the 260,000 hp. called for under the contract, though the plants now operating at Chelsea and Farmers Rapids and serving the International Paper Company will take care of inequalities and emergencies. A dam being built below the Paugan Falls will back the water up to Chute Calumet, a distance of 30 miles, drowning out nine falls and rapids and creating a head of 136 ft. At Paugan Falls one unit of 34,000 hp. is now ready for service, and a second one is expected to be ready very soon.

Denver Contractors Oppose N.E.L.A. Committee

Recommendations made by the wiring committee of the Commercial National Section of the N.E.L.A. have brought forth a strong protest from 65 Denver electrical contractors, which has been presented in writing to the Electrical League of Colorado. The contractors say:

"This report leads definitely toward the conclusion that the central stations should enter the electrical contracting business, employing electrical contractors or wiremen as their workmen on a piece-work basis, and that the cost of conducting such electrical contracting business should be absorbed by the central stations under the advantages which they are now employing in many cases to conduct merchandising departments without regard to costs or profits. Such a policy would inevitably establish the level of contracting and wiring prices in the minds of the public at such levels as to destroy the business of electrical contractors attempting to operate on a normal basis of profit."

Northwest Association Ready for Portland Meeting

The program for the twenty-first annual convention of the Northwest Electric Light and Power Association, to be held at the Multnomah Hotel, Portland, Ore., on June 19 to 22, has been issued. Following are the events of main interest:

GENERAL SESSIONS

Tuesday Morning, June 19.—President's address, A. C. McMicken; address, P. S. Arkwright, vice-president N.E.L.A.; address, J. M. Thomson, president Idaho Public Utilities Commission.

Wednesday Morning, June 20.—Report Commercial Section, J. C. Plankinton; address, E. C. Greenwood, commercial director N.E.L.A.; address, J. T. Jardine, chairman Oregon C.R.E.A.; "The New Day in Merchandising," Stephen I. Miller, executive manager National Association of Credit Men.

Thursday Morning, June 21.—Report Engineering Section, O. L. LeFever; address, W. H. Onken, Jr., editor ELECTRICAL WORLD; report Accounting Section, F. W. Brownell; address, Prof. C. S. Dakan, University of Washington.

Friday Morning, June 22.—Report Public Relations Section, George L. Myers; finals in employees' and managers' public speaking contests and reading of winning essays in three competitions; address, P. S. Clapp, managing director N.E.L.A.

Dancing, boating, golf, cards and excursions will fill the afternoons and evenings.

Getting Ready for Camp Co-operation VIII

Camp Co-operation VIII, the annual conference of representatives of electrical leagues, will be held at Association Island, near Henderson Harbor, N. Y., Thursday, Aug. 2, to Tuesday, Aug. 7, inclusive. The first three and the last two days will be devoted to business sessions. This camp will be held under the auspices of the League Council and sponsored by the Society for Electrical Development, as in the past. Attendance will be by invitation, which will be extended to officials of leagues and others actively interested in local and national co-operative development of the market.

The business program has already received consideration. It is the purpose to emphasize those features of local co-operative work and market promotion that will make the league productive of larger results and a force of greater influence in its community. To this end addresses and papers will be presented and discussions conducted on those league practices noteworthy for their successful results. Profitable objectives the league should strive for and elimination of wasted effort through the selection of worth-while activities will receive major attention. There will also be opportunity for discussion and exchange of experiences in the problems of league operation and management. The "red seal" plan and other national movements for widening the market will come in for their share of consideration.

Purchases and Mergers

Pennsylvania Power & Light Asks Authority to Buy Controlled Companies and Acquire Others—Southwestern Public Service Sold to Texas Utilities Company

PLANS for consolidation of Lehigh Power Securities Corporation properties in Pennsylvania were revealed last week by the filing of applications with the Public Service Commission by the Pennsylvania Power & Light Company for authority to acquire outright 35 small operating properties already controlled by it and to obtain control of ten others. The new companies of which control is sought include, in addition to gas, railway and water concerns, the Harrisburg Light & Power, Lehighton Electric Light & Power, Pine Grove Electric Light, Heat & Power and Juniata River Water Power. The companies which the Pennsylvania Power & Light wishes to acquire outright include the East Penn Electric of Allentown and plants in various boroughs and towns. Among the larger places are Juniata, Honesdale, Hummelstown, Montgomery, Montoursville, Hughesville, Clymer and White Haven.

Purchase of the holdings of the Southwestern Public Service Company, consisting of fourteen public utility plants in Amarillo and other towns of the Panhandle of Texas and eastern New Mexico, by the Texas Utilities Company and the New Mexico Utilities Company is announced by Judge I. R. Kelso of St. Louis, president of the Texas Utilities Company. The purchasing companies are owned by the same interests and operate 43 plants in northwestern Texas and New Mexico. Transfer of the properties will be made on July 1. The merger will give the 43 towns in which the Texas Utilities Company has been operating a connection with the gas-fuel power plant erected in Amarillo last year by the Southwestern Public Service Company. The transferred properties are estimated to be worth upward of $4,000,000. The Southwestern Public Service Company operates to the northeast of Amarillo as far as Pampa, a power transmission line running from Amarillo through Panhandle to Pampa and west into New Mexico as far as Carlsbad. The Texas Utilities Company covers a wide territory coming as close to Amarillo as Canyon, 20 miles to the south.

Application has been been made to the Arizona Corporation Commission by the Public Utilities Consolidated Corporation of Arizona to purchase the American & Foreign Utilities Corporation of Delaware from the W. B. Foshay Company of Minneapolis. The Delaware organization controls the Alaskan Utilities Company of Alaska, the Managua Utilities Company of Nicaragua, the Eel River Power Company, near Indianapolis, and the East Minnesota Power Company of Minnesota.

The Western Public Service Company of Scottsbluff, Neb., has purchased the locally owned plant at Mitchell and will serve it by transmission lines.

The Kentucky holdings of the General Power & Light Company of New York have been bought by the Kentucky Utilities Company. They include an electric transmission system connecting the towns of Calhoun, Corydon, Rumsey, Poole, Slaughters and Sebree.

The Illinois Commerce Commission has granted the Central Illinois Power Service authority to purchase the Elizabethtown Power & Light Company system for $8,681.

The Midway electrical distribution system, near Kannapolis, N. C., has been acquired by the Southern Public Utilities Company from the Midway Lighting & Improvement Company.

The People's Hydro-Electric Corporation of Vermont, Montpelier, Vt., has petitioned the Vermont Public Service Commission for authority to acquire properties in Eden, Hyde Park and Wolcott, identified under the name of the Green River Power Development, for $163,571.

Impetus to Hydro Development in New York

Court of Appeals Decision in Niagara, Lockport & Ontario Case Removes a Source of Delay by Public Service Commission

WATER-POWER development in New York State on a scale far greater than anything in the past may follow action by the Public Service Commission now that the Court of Appeals has upheld the validity of the so-called Miller water-power law. At least half a score of proposed mergers of power resources are awaiting action by the commission, which had postponed decision pending the outcome of the litigation which the Court of Appeals passed upon last week.

One of the first cases that will receive consideration is that of the Rochester Gas & Electric Company, which has an application to absorb a small neighbor under the terms of the water-power law. The provision of the law which had been challenged as unconstitutional was one which said in effect that a water-power company developing the major part of any specific site might, as a matter of public convenience and necessity, absorb by right of eminent domain another concern that was developing a minor part of the same site. As reported last week (page 1159), the Court of Appeals upheld this principle in the litigation that grew out of the application of the Niagara, Lockport & Ontario Power Company, made almost four years ago, to take over and develop certain power resources on the Salmon River in Oswego County owned and operated by the Horton interests, which had a minor devlopment on a power site there where the Niagara, Lockport & Ontario had a major development.

The Public Service Commission granted the request of the Niagara, Lockport & Ontario Company. The ruling was the immediate sequel for a battle of the courts. Attorneys for the Horton interests argued that approval of the application meant that the big water-power companies of the state would gobble up their smaller neighbors.

International Union Meets at Paris on July 5-10

Announcement comes from Paris that the Union Internationale des Producteurs et Distributeurs d'Énergie Electrique will hold its next congress in that city on July 5 to 10. The program provides for the formal opening on Thursday morning, July 5; business sessions on Thursday afternoon, Friday morning and afternoon, Saturday morning and afternoon, Monday morning and Tuesday morning, July 10, and the closing session on Tuesday afternoon. There will be a reception at the City Hall on Saturday, excursions by automobile to Chantilly, Fontainebleau or Longchamp on Sunday, and visits to various power houses and industries on Monday afternoon, as well as the reception of a delegation by the President of the Republic and a banquet at the Cercle Interallié, followed by a "soirée artistique."

A provisional trip through the region of the Pyrenees, to follow the congress, has been arranged, though all the details cannot be finally determined until the number of participants is known. Those taking this trip will leave Paris on Wednesday morning, July 11, and journey to Bordeaux, whence they will depart on Thursday afternoon for Pau, leaving there next day for Lourdes. Sunday the trip will end at Carcassonne.

The National Electric Light Association is represented in the Union Internationale by John W. Lieb of New York, Samuel Insull of Chicago and Charles L. Edgar of Boston. To the coming congress William H. Onken, Jr., editor ELECTRICAL WORLD, has been appointed by President Sands as an additional delegate. Mr. Lieb will present reports on public relations, electric vehicles, and electrical accidents and resuscitation.

London Sectional Meeting of World Power Conference

A sectional meeting of the World Power Conference, to be held at the Imperial Institute, London, from Sept. 24 to Oct. 6, will take the form of a fuel conference. This meeting, organized by the British national committee of the World Power Conference, with the approval of the international executive council, will be the second sectional conference since the plenary meeting in the summer of 1924, the first of these having taken place at Basle, Switzerland, two years ago. Representatives of the United States will participate.

The program is divided into five classes and four intersecting divisions. The classes are: (I) Solid fuel; (II) liquid fuel; (III) gaseous fuel; (IV) fuel utilization, general; (V) general aspects. The divisions are: (1) Composition and classification of fuels; (2) preparation of fuels; (3) storage, handling and transmission of fuels; (4) utilization of fuels. The divisions

are subdivided into sections, and in the first three classes 35 subjects are in this way arrived at. Under "fuel utilization" come three topics—utilization of electricity for industrial heating, utilization of electricity for domestic heating, and waste-heat recovery. Under "general aspects" three further topics are included—the training of fuel technicians, a survey of the scope of organizations concerned with the efficient use of fuel in industry, and the economic possibilities in the better coordination of fuel utilization.

The papers may be written in English, French or German. They shall not exceed 7,500 words, and every paper is to be accompanied by a résumé not exceeding 500 words in either of the two languages other than that in which it is composed. O. C. Merrill, executive secretary of the Federal Power Commission, Washington, is the secretary of the American National Committee of the World Power Conference.

Empire State Commercial Section to Meet at Utica

Meeting at Utica, N. Y., on June 28 and 29, the Commercial Section of the Empire State Gas and Electric Association will carry out a program including the following papers:

Thursday Morning.—"Commercial Department Organization and Management," W. J. Reagan, Utica Gas & Electric Company; "Home Service," Mrs. Sarai Waugh, Westchester Lighting Company; "Future Load Estimation," F. T. Bolster, Syracuse Lighting Company; "Rural Use of Service," R. F. Bucknam, State College of Agriculture.

Thursday Evening.—"Electric Refrigeration," Walter O. Howe, Niagara, Lockport & Ontario Power Company; "Electric Water Heating," H. C. Wilder, Northeastern Power Corporation.

Friday Morning.—"General Merchandising Policies," H. C. Wilder, Northeastern Power Corporation; "Merchandise Accounting," H. C. Davidson, chairman Accounting Section; committee reports.

H. O. Palmer, president of the association, will address the Friday meeting.

Rural Electric Session for the Agricultural Engineers

The annual meeting of the American Society of Agricultural Engineers will be held this year at the Hamilton Hotel, Washington, on June 19 to 22. On Thursday, June 21, there will be morning and afternoon rural electric sessions, with E. A. White, of the Committee on the Relation of Electricity to Agriculture, in the chair. The following papers by prominent central-station officials, engineering-college professors and others are scheduled:

Morning.—"Organization of an Electric Light and Power Company for Rural Development," G. C. Neff; "The General-Purpose Motor," Charles P. Wagner; "Electric Characteristics of Rural Lines," Prof. Frank D. Paine; "Research in Rural Electrification, 1927," R. W. Trullinger; "Extension Methods for Rural Electrification," Prof. H. B. Walker; "Recent Developments in Rural Rates," E. A. Holloway.

Afternoon.—"Round table" on electricity in the farmhouse, Mrs. John D. Sherman, Miss Eloise Davison, E. C. Easter and H. J. Gallagher taking up respectively the general topic, cooking, refrigeration and water supply, and Dr. Louise Stanley, chief of the Bureau of House Economics, Department of Agriculture, leading the discussion.

Briefer News

IOWA TOWN REJECTS COMPETITIVE PLANT.—Voters of Missouri Valley, Iowa, a place of 5,000 population, at a special election just held refused a petition of the Des Moines Utilities Company for permission to establish and operate an electric light plant in that city, which is served by the Iowa-Nebraska Light & Power Company.

AMPÈRE'S HOME PRESENTED TO FRENCH ASSOCIATION.—The boyhood home of Ampère, near Lyons, France, has, a cable dispatch to the New York *Times* says, been purchased by Sosthenes Behn, president of the International Telephone & Telegraph Company, and his brother Harmand, and presented by them to the Société Française des Electriciens for the purposes of an electrical museum.

VIRGINIA-CAROLINA POWER COMPANY PLANS 50,000-HP. PLANT ON THE ROANOKE.—The Virginia-Carolina Power Company has applied to the Federal Power Commission for leave to construct a concrete dam on the Roanoke River, in Brunswick County, Va., and Warren County, N. C., to be used for public utility purposes. There will be a head of 35 ft. and the dam will back water for about 20 miles. The surface area of the reservoir will be about 3,500 acres and the estimated storage about 500,000,000 cu.ft. A steel and concrete power house is planned with a proposed installed capacity of 50,000 hp., which will be used for public utility purposes.

I. E. C. ADVISORY COMMITTEE TAKES UP STANDARDIZATION OF STEAM-TURBINE TEST CODES.—Word has been received by cable that a meeting of the steam-turbine advisory committee of the International Electrotechnical Commission held at The Hague, Holland, during the week of May 20 was a noteworthy one, eight nations being represented by 23 well-known engineers. This committee is attempting to reconcile the various test codes for steam turbines now used throughout the world and to develop a standard code for international adoption. The United States was represented by I. E. Moultrop, Edison Electric Illuminating Company of Boston, and Francis Hodgkinson, Westinghouse Electric & Manufacturing Company.

TRANSMISSION LINES TO GO UNDERGROUND AT LONG BEACH, N. Y.—Following a spectacular fight in the endeavor to erect overhead transmission lines at Long Beach, a Long Island (N. Y.) seacoast resort, in which early-morning construction gangs, the police and court injunctions played a part, with wrangling municipal officials at odds over whether the lines should be permitted, the Queens Borough Gas & Electric Company has agreed, in deference to public sentiment, to the revocation of a permit previously issued, to remove lattice towers already erected, to fill in existing excavations and to place all wiring underground in conduits. The sandy nature of the soil has led to some doubt as to the feasibility of underground construction.

LIGHTING COURSE AT NELA PARK NEXT WEEK.—From June 11 to 16 a general course in lighting will be given by the Nela School of Lighting at Nela Park, Cleveland. In the last seven years 1,500 students have attended the 30 one-week courses that have been given, and advance registration proves that this month's course will be attended in excess of expectations. Registration is open to all men and women engaged in the lighting business.

ENLARGED TRANSMISSION SYSTEM OF MEMPHIS POWER & LIGHT COMPANY.—Completion by the Memphis Power & Light Company of a new substation in South Memphis has provided a link for its Mississippi and Arkansas interconnections and with a substation recently built in the northern part of Memphis, at Decatur Street and Lane Avenue, will play an important part in the enlarged service now given as the result of a program initiated when the company was reorganized five years ago. The South Memphis substation has a capacity of 15,000 kva. It is tied to the Memphis power plant through two 12,000-volt double four-phase circuits and to the Mississippi and Arkansas properties through a 110-kv. line running south to the Tennessee-Mississippi line. There will soon be completed also an interconnecting line with the transmission system of the West Tennessee Power & Light Company, adjoining the company's territory to the north.

BONBRIGHT & COMPANY ISSUE HISTORICAL ELECTRIC MAP.—"A historical map of the United States of America representing the development of the electric light and power industry" has just been issued by Bonbright & Company, New York, from a design by Ernest Clegg. This is a beautifully illuminated and lithographed map, 42 in. by 27 in. in size. Superimposed upon it, besides charts showing the capital invested, the energy generated and the voltages in use by the electric light and power industry in 1928, are 24 small pictures illustrating the outstanding events in electrical invention and progress from the production of the Brush arc lamp in 1876 down to the 220-kv. transmission, the gigantic steam turbo-generators and the huge hydro-electric dams of the present day. The map is drawn on the scale of 100 miles to the inch and will prove a worthy ornament for light and power offices and board rooms.

MISSOURI COMMISSION APPROVES NEW RATES OF UNION ELECTRIC LIGHT & POWER.—The Missouri Public Service Commission has approved the reduced rates of the Union Electric Light & Power Company of St. Louis, which became effective in that city on June 1. The new rates, explained in the ELECTRICAL

WORLD for May 12 (page 984), will reduce the annual income of the company on the basis of present consumption $700,000. Large consumers benefit most from the cut rates. Residence rates for St. Louis remain unchanged, but residence rates for St. Charles, Washington, Festus, St. Clair, Pacific, De Soto, Union and other towns served by the company in St. François County were reduced. To meet the new rates of the Union Electric Company, the Laclede Power & Light Company, which supplies electricity to about 17,000 consumers in St. Louis, on June 1 filed a schedule of lower rates with the commission. The reduction, which affects only commercial and industrial consumers, will reduce the power and light bills of its large consumers $75,000, or 7 per cent, per year.

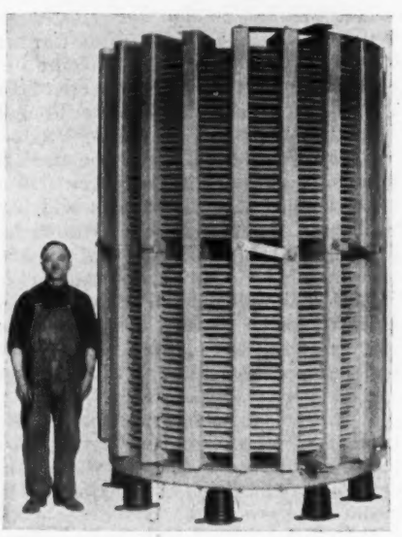
FOSHAY PURCHASES SAN FRANCISCO BUILDING.—Establishment of Pacific Coast headquarters of the W. B. Foshay Company, public utility operator, in its own building, recently acquired in San Francisco, and plans for expansion on the Pacific Coast, have been announced by W. B. Foshay, president. The building is on Kearney Street and after remodeling will be ready for occupancy Sept. 1.

WASHINGTON WATER POWER COMPANY BUYS A SITE ON THE SPOKANE.—The Washington Water Power Company of Spokane has purchased a power site of the Spokane Valley Power Company on the Spokane River a few miles below the city. There is said to be a potential head of 80 ft. and a potential power development of 15,000 hp. at low water.

COLORADO PUBLIC SERVICE COMPANY WILL NOT IMPAIR ROYAL GORGE.—An announcement has been made by the Public Service Company of Colorado that it will abandon plans for developing power on the Upper Arkansas River near Cañon City rather than impair the scenic value of the Royal Gorge. It asks the Colorado Public Utilities Commission to determine what flow of water through the Gorge is necessary to preserve it as a scenic wonder and asserts that it will never reduce the flow below the volume held to be necessary. If engineers determine that the river's flow above the specified volume is insufficient to justify the hydro-electric development, the latter will be abandoned, the company states.

SURVEY OF LOWER DEVIL'S RIVER IN TEXAS TO FOLLOW FILINGS ON UPPER SITES.—Application has been granted by the Texas Board of Water Engineers to James C. Kennedy of Dallas, understood to represent the Insull interests, for authority to make a power survey of Devil's River from the point where it empties into the Rio Grande for one-half of its length. The purpose of this exploration is to determine how much water power may be available for generating electrical energy. The Insull interests already have filed on the upper flow of Devil's River and will construct one or more hydro-electric plants under their original authority to appropriate water from that stream. If the survey of the lower flow of the river justifies such action, they also will construct a large hydro-electric plant above Del Rio. From these proposed plants a power transmission line will be constructed to San Antonio and other points.

A GIANT REACTOR FOR BALTIMORE.—A neutral grounding reactor rated at 80,000 kva. on a four-minute basis is being built by the General Electric Company at Pittsfield, Mass., and will be installed at the Westport station of the Consolidated Gas, Electric Light & Power Company of Baltimore, to ground its 25-cycle system. It stands over 9 ft. high and weighs 8 tons. The reactor is of standard cast-in concrete design and is supported on eight extra-heavy porcelain insulators. This apparatus is the largest of a number of giant reactors manufactured by the General Electric Company in recent



months. Several of these have been supplied to the Brooklyn Edison Company for its Hudson Avenue station. Nineteen are to be used in sectionalizing the 22,000-volt bus of the State Line Generating Company's station at Hammond, Ind. Still another, of the iron-core type, was recently installed at the Amite (La.) substation of the Louisiana Power Company.

AMERICAN AND MEXICAN ENGINEERS FRATERNIZE.—Addresses by railroad executives, industrial managers and educators were features of the fourteenth annual convention of the American Association of Engineers, which was held in El Paso, Tex., this week. Simultaneously Mexican engineers were in convention at Juarez, across the Rio Grande, and opportunities for fraternizing were plentiful. After the convention four specially planned trips took delegates to Cloudcroft in the Sacramento Mountains, to the Elephant Butte Dam in New Mexico, to the Carlsbad Caverns in the Pecos Valley, and to the Boquilla Dam near Santa Rosaria, Mexico.

PENNSYLVANIA RAILROAD'S PLANS FOR ELECTRIFICATION AT BALTIMORE.—Reversing its position at the instance of the city authorities, the Pennsylvania Railroad has agreed to electrify its Calvert Street yards in Baltimore, instead of using storage electric or gas-motor equipment in that section, as at first planned. A question concerning overhead or underground transmission is still matter for negotiation, the railroad's plans for erecting its lines on 40-ft. poles above the streets of the city being strongly opposed by the Mayor and by many citizens.

"NARROW-GAGE" RAILROAD TO BE ELECTRIFIED BY NOVEMBER.—Electrification of the Boston, Revere Beach & Lynn Railroad, more familiarly known throughout eastern New England as the "Narrow-Gage," between Lynn and Boston, will be completed about Nov. 1, according to Vice-President G. W. Wells. Power for the Lynn end of the railroad will be supplied by the Lynn Gas & Electric Company and for the Boston end by the Edison Electric Illuminating Company of Boston. Contracts for furnishing motors and equipment for cars are being filled by the General Electric Company. Two substations, one in Lynn and the other at Orient Heights, will transmit power direct to the overhead trolley system, each car to be self-propelling and equipped with multiple-unit control. The railroad is expected to require 9,300,000 kw.-hr. annually, and the two substations will supply the power in parallel. The three-foot gage will be retained on the entire system, totaling 17 miles of double track. The service improvement program will cost more than $1,000,000.

SPECTACULAR SIGN FOR REPUBLICAN CONVENTION.—A jeweled "sunburst" depicting a huge American eagle, the emblem of the Republican party, is being erected in Kansas City for the Republican National Convention there next week. W. D'A. Ryan, director of the illuminating engineering laboratory of the General Electric Company, describes it as 19 ft. in diameter and covered with 7,500 "Novagem" jewels each about 2 in. in diameter and cut in the shape of a diamond. It was designed by J. W. Gosling of the General Electric Company. Two batteries of searchlamps will be turned on the sign at night. Its outer edge will be covered with jewels of canary yellow, next will come a circle of stars of white jewels, and over the center will be the eagle covered with white jewels on a background of ruby gems.

NEWFOUNDLANDER HAS PLAN TO USE LABRADOR'S WATER POWER.—Possibility of the development of a big electrolytic steel project in conjunction with the water power available at Grand Falls on the Hamilton River, in Labrador, is emphasized by Victor Gordon, High Commissioner of Newfoundland in England, in a letter to the London *Times*. "It is an authentic fact," writes Mr.

Gordon, "that Labrador possesses a single great series of power resources which, if harnessed, could produce almost as much electricity as all the existing plants in the Dominion of Canada. Through the center of the peninsula of Labrador flows a mighty stream, the Hamilton River, and at one point in the course of the five miles it drops 200 ft. in tremendous rapids and then, with a roar audible 20 miles away, it makes a final plunge into a circular basin 315 feet below. Here is a cataract as large as Niagara, and experts have calculated that more than 4,300,000 hp. could be obtained from it." Mr. Gordon goes on to point out that there are within a radius of 75 miles in a northward direction from Grand Falls immense ore bodies of hematite, magnetite and siderite, rich in manganese, whose yield of metallic iron has been estimated as varying between 40 and 55 per cent. "There is no reason why the success which has attended the manufacture of electrolytic steel on the Italian side of the Alps should not be reproduced in Labrador," he declares.

Coming Meetings

[A complete directory of electrical associations, with their secretaries, is published in the first issue of every volume. For latest list see ELECTRICAL WORLD for Jan. 7, page 80.]

National Electrical Manufacturers' Association—The Homestead, Hot Springs, Va., June 11-15. S. N. Clarkson, 420 Lexington Ave., New York.

Artistic Lighting Equipment Association—Hotel Sherman, Chicago, June 11-16. G. P. Rogers, 420 Lexington Ave., New York.

Pacific Coast Division, N.E.L.A.—Hotel Huntington, Pasadena, Cal., June 12-15. S. H. Taylor, 447 Sutter St., San Francisco.

Georgia Electrical Association—Savannah, June 14 and 15. J. J. McDonough, Georgia Power Co., Dublin, Ga.

Northwest Division, N.E.L.A.—Portland, Ore., June 19-22. B. Snow, 1208 Spalding Bldg., Portland, Ore.

American Society of Agricultural Engineers—Rural electric session, Hamilton Hotel, Washington, June 19-22. Raymond Olney, St. Joseph, Mich.

Canadian Electrical Association—SS. "Richelieu" from Montreal to Saguenay and return, June 20-23. H. M. Lyster, 712 Power Bldg., Montreal.

American Institute of Electrical Engineers—Cosmopolitan Hotel, Denver, June 25-29. F. L. Hutchinson, 33 West 39th St., New York.

Association of Iron and Steel Electrical Engineers—Hotel Stevens, Chicago, June 25-28. J. F. Kelly, Empire Bldg., Pittsburgh.

American Society for Testing Materials—Chalfonte-Haddon Hall, Atlantic City, N. J., June 25-29. C. L. Warwick, 1315 Spruce Street, Philadelphia.

Empire State Gas and Electric Association—Commercial Section, Hotel Utica, Utica, N. Y., June 28 and 29. C. H. B. Chapin, Grand Central Terminal, New York.

Public Utilities Advertising Association—Detroit, July 8-12. T. P. Pfeiffer, Byllesby Engineering & Management Corp., Chicago.

East Central Division, N.E.L.A.—Cedar Point, Ohio, July 10-13. D. L. Gaskill, Greenville, Ohio.

National Electric Credit Association—Boston, July 16 and 17. F. P. Vose, 1008 Marquette Bldg., Chicago.

Wisconsin Utilities Association, Electric Section—Appleton, Wis., July 26 and 27. J. N. Cadby, 432 Broadway, Milwaukee.

Commission Rulings

PRIOR ILLEGAL OPERATION TO MAINTAIN CONTINUITY OF SERVICE NOT GROUND FOR REFUSING CERTIFICATE.—In granting an application from the Pacific Gas & Electric Company to supply gas under a franchise, the California Railroad Commission said that a certificate for the operation of a utility should not be denied on the ground that a private company in taking over a system previously constructed and operated by a municipality has functioned without authority for an unavoidable interim between the change of management and the subsequent formal grant of commission authority, because of the indispensable public need for the continuity of service.

PREMISES ASTRIDE TERRITORIAL BOUNDARY MAY BE SERVED FROM EITHER SIDE.—Dismissing a complaint of territorial invasion made by the Vallejo Electric Light & Power Company against the Great Western Power Company, the California Railroad Commission said: "Where a structure or group of structures which might reasonably be considered as requiring one complete service, such as a toll house which is a necessary adjunct to a bridge, are so located as to lie across a territorial boundary of two competitive utilities, the consumer should be permitted to take service from either side of such boundary line." The complainant had held that its competitor had no right to render service on that portion of a bridge within the Vallejo company's territory. The commission, however, added: "The conditions to which this conclusion applies are to be carefully distinguished from an instance where the consumer might build his electric facilities over a boundary line established by the commission to defeat the purpose for which such boundary was established."

CAPITALIZATION OF ESTIMATED SAVING BY DEVELOPMENT OF UNUSED WATER SITES DISAPPROVED.—The Oregon Public Service Commission has for rate-making purposes ordered that the valuation of the ten utilities owned and operated in that state by the People's West Coast Hydro-Electric Corporation be fixed at $580,911. In arriving at the valuations of these properties, the commission states, it was impossible to make a finding in regard to the stocks and bonds of the corporation for the reason that neither class of securities is "currently quoted upon the market, nor does the record contain any testimony relative to their value." The commission also found it impossible to attempt to ascertain original cost data, owing to the absence of definite information relative to dates when portions of the properties were placed in service. The commission held that the consideration of possible values of water rights upon estimates based upon the capitalized estimated saving in cost of service which might be accomplished by the use of hydro-electric operation as compared with the operation of theoretical steam plants designed to produce an equivalent amount of power results in no practical value in so far as valuation of properties as a whole is concerned. "This capitalization theory," says the order, "would by its acceptance operate to deprive the community of one of its natural resources and permit its capitalization for the sole benefit of the operator. The commission cannot concede that any theory which will operate to this effect is sound in principle."

COMMISSION REFUSES TO COMPEL COMPANY TO PAY FOR PUTTING CUSTOMERS' WIRES UNDERGROUND.—The Massachusetts Department of Public Utilities has dismissed a petition from residents of Hyde Park to compel the Edison Electric Illuminating Company of Boston to bear the expense of placing underground the wires serving the petitioners' property on a street where the company is placing the wires underground by order of the fire commissioner. The department says: "The company is willing to do the necessary work on the customers' premises at their expense, or is willing to allow the work to be done by the customers or by any one employed by them so long as it meets the reasonable requirements of the service. The petitioners desire the work on their premises done by the company at its own expense." If additional legislation is contemplated, the department holds, there should be a provision for a public hearing by the fire commissioner on the proposed order after notice has been given to the company and to the owners of abutting property.

Recent Court Decisions

COMPANY FOUND NOT RESPONSIBLE FOR RESULTS FOLLOWING BREAKING OF TRANSMISSION LINE BY FELLED TREE.—Five appeals from judgments in cases concerning the Kentucky Utilities Company, its plant engineer (Sandidge), the administrators of a farmer (Woodrum) and his son who were killed by electric shock, and the guardian of another son injured in the same accident, were heard by the Court of Appeals of Kentucky. Two of these appeals were brought by the defendant company and the others by the three plaintiffs. All were resolved in favor of the company. The farmer and his sons felled a tree so that it would fall parallel to the transmission line. In falling, a branch struck one of the wires and broke it. The accident caused the main line switch at the power house to "kick out," and consequently the farmer picked up the broken wire without injury to himself. While he was holding it the plant engineer threw the switch back, the sons rushed to their father's aid and the results just stated occurred. Damages were sought on three grounds: (1) That the transmission line was defectively constructed and not properly maintained; (2) that the act of Sandidge in reclosing the switch without investigating the cause of its opening was negligence; (3) that the company was a trespasser because it had no lawful right to maintain its line along the highway and because the line extended partly over the property line of the Woodrum farm. None of these contentions was held proved, the Court of Appeals pointing out also that the proximate cause of the accident was the victims' own action in felling the tree. Three judges, while sustaining the finding, dissented from the opinion that the plant operator's action in closing the switch without investigation was consistent with the highest degree of care, holding that the motive involved was the economic one of continuing service, which should be subordinate to that of safeguarding life. (5 S.W. [2d] 283.)*

*The left-hand numbers refer to the volume and the right-hand numbers to the page of the National Reporter System.

News About Men of the Industry

H. H. Barnes, Jr., Appointed Manager in New York

H. H. Barnes, Jr., has been appointed manager of the New York district of the General Electric Company to succeed Theodore Beran, who recently retired. Mr. Barnes has for many years been a prominent figure in the district and his experience and training make him eminently fitted for his new position. He was born in New York City in 1875 and was graduated from Stuttgart Polytechnicum in Germany in 1897. He worked with Siemens & Halske, Berlin, until 1899, then as superintendent of the Mexican Electric Works, Ltd., in the city of Mexico, until 1901. He was

H. H. Barnes, Jr.

staff engineer and manager of the engineering department of the Stanley Electric Manufacturing Company, predecessor of the Pittsfield Works, until 1907. He was then made engineer of the New York district. He also became assistant district manager in 1920, and relinquished his duties as district engineer in 1927 to devote all of his time to executive work.

Mr. Barnes is a fellow of the American Institute of Electrical Engineers, of which he was a manager from 1910 to 1913 and a vice-president from 1913 to 1915. He was a trustee of the United Engineering Society, New York, from 1912 to 1917 and from 1921 to 1926 and is a past-president of the New York Electrical Society. He is a member of the American Society of Mechanical Engineers and of the Society of Naval Architects and Marine Engineers. On Saturday evening, May 12, the New York office committee met at the Engineers Club for a welcoming dinner to Mr. Barnes.

WILLIAM CHAMBERLAIN, since 1914 vice-president and general counsel of the United Light & Power Company, was elected president at the annual meeting of directors, succeeding Richard Schaddelee, resigned, who was elected chairman of the executive committee. Mr. Schaddelee, who was one of the organizers of the United Light & Railways Company, predecessor of the United Light & Power Company, had been general manager since 1904 and president since 1926.

ALEX DOW, president of the Detroit Edison Company, sailed for Europe May 23 on the *Mauretania* for a six weeks' business and pleasure trip abroad.

J. B. KLUMP has been elected a director of the Central Indiana Power Company to succeed G. W. Curran on the board.

WILLIAM H. TAYLOR was elected president of the Philadelphia Suburban-Counties Gas & Electric Company to succeed Arthur W. Thompson, who resigned to become chairman of the board. Mr. Taylor is also president of the Philadelphia Electric Company.

PHILIP G. GOSSLER, president and chairman of the board of the Columbia Gas & Electric Company, New York, sailed for Nassau and Miami on the Munson liner *Munamar* June 1 for a short stay in the South.

DR. JOHN B. WHITEHEAD, dean of the School of Engineering of John Hopkins University, has consented to serve on an advisory commission appointed by Mayor Broening of Baltimore to act in a consulting and supervisory capacity over the activities of municipal agencies in connection with electrification work to be undertaken by the Pennsylvania Railroad in the city of Baltimore.

CARL N. THOMAS has been appointed superintendent of distribution of the Narragansett Electric Company, Providence, R. I., succeeding S. B. Swan, who was recently promoted to the general managership of the company. Mr. Thomas joined the Narragansett organization in 1902 and has been active in its engineering development since that time. He is widely known in New England electrical circles. RALPH P. ORMSBEE has been appointed assistant superintendent and RICHARD B. PARSONS has been made underground engineer, in charge of underground transmission and distribution.

WILLIAM HUNTER has been appointed electrical superintendent of the Albany district of the New York Power & Light Corporation.

E. E. ARNOLD has affiliated himself with the Westinghouse Electric & Manufacturing Company in the capacity of mechanical engineer for special assignment. Mr. Arnold is returning to the Westinghouse interests after an absence of twenty years, having resigned in 1908 from the Westinghouse Machine Company to enter other fields of endeavor. He has a background of 30 years' experience in designing, testing, consulting and executive capacities.

W. S. Richhart to Manage Light and Power Department

William S. Richhart, electrical engineer for the Indiana Service Corporation, Fort Wayne, Ind., for the past eleven years, has been named manager of the light and power division of that utility to succeed Robert L. Fitzgerald, whose resignation took effect May 1. Mr. Richhart has had a wide and varied experience in the course of his career, which has comprised academic work as well as practical engineering in both the manufacturing and central-station branches of the electrical industry.

Graduating from Purdue University in 1905, Mr. Richhart was engaged in

W. S. Richhart

research work at the university for approximately one year, leaving this work to become instructor of electrical engineering at the University of Pennsylvania, which position he held for five years. Following the work at the University of Pennsylvania he was employed for five years as division service engineer for the Westinghouse Electric & Manufacturing Company in the Philadelphia district. In 1916 he returned to Indiana, where he spent approximately one year as electrical engineer with the Public Service Commission of Indiana, before becoming connected with the Indiana Service Corporation as electrical engineer. Mr. Richhart is a member of the American Institute of Electrical Engineers.

J. T. LOGAN has been appointed operating engineer of the Georgia Power Company, succeeding A. H. Parham.

WALTER S. WYMAN of Augusta, Me., was elected president of the Cumberland County Power & Light Company at the recent annual meeting as successor to Harry M. Verrill, who became chairman of the board of directors. Mr. Wyman, who is prominent in utility circles in New England, is also president of the Central Maine Power Company.

Financial and Statistical News

"M.U.I.T." Issues First Report

The Massachusetts Utilities Investment Trust, or "M.U.I.T.," as it is widely known in New England, has made public its first annual report, covering operations for 1927. The trust was organized March 31 of last year and controls utilities serving 116 cities and towns in the Bay State with either gas or electricity or both, either at retail or through wholesale contracts. It has acquired from 80.03 to 100 per cent ownership of the various companies operated. The total population served is about 620,000. The trust also owns, with affiliated groups, 20,000 shares of the common stock of the Edison Electric Illuminating Company of Boston, but this is only a small percentage of the total Edison shares outstanding. Forty-six utilities are included in the trust's operations.

The gross operating revenue for 1927 was $9,851,726 compared with $9,500,-157 consolidated revenue for these companies in 1926 and $8,872,631 in 1925. Net earnings available for dividends and depreciation in these years were respectively $2,658,839, $2,459,995 and $2,417,-351. Last year's electric operating revenue was $7,224,014. Based on holdings as of Dec. 31, 1927, the total net income available for 1927 for dividends, depreciation and reserves was $3,085,080. Dividends on the annual basis to preferred shareholders were $1,310,581 and to minority shareholders of operating, holding and leased companies $267,507, leaving a balance for depreciation, reserves and surplus of $1,506,991. The total assets Dec. 31 last were $40,950,-486. Energy sales last year totaled 147,-192,570 kw.-hr. and there were 103,526 electric and 61,189 gas customers on the books.

General Electric Declares Extra Dividend.—The General Electric Company declared an extra of $1 on the common stock and regular quarterly dividends of $1 on the common and 15 cents on the special stock (par $10), all payable July 27 to stock of record June 15. For the past two years the General Electric Company has paid an extra cash dividend of $1, previously having paid extras on common stock in the form of $1 in special stock.

Standard Gas Stockholders Offered Rights.—Holders of the $4 cumulative preferred stock of the Standard Gas & Electric Company have been offered rights to subscribe to additional stock of the same class at $66 per share in the ratio of one new share for each four held. Stockholders of record June 12 will be entitled to subscribe to the new stock. The $4 preferred stock was formerly the 8 per cent cumulative preferred, the change in the dividend having been authorized in conjunction with other changes in the corporation's capital structure at a special meeting held May 16. No increase in the authorized $4 preferred will be necessary since the authorized amount of this issue was increased to 1,500,000 shares from 600,000 shares at the meeting referred to.

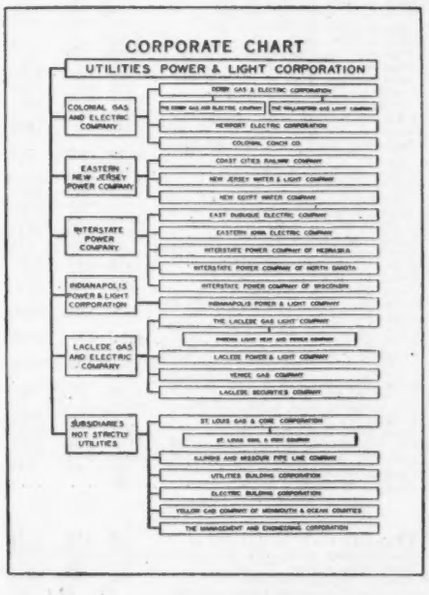
Quebec Power Offers New Shares to Stockholders.—Directors of the Quebec Power Company have voted to offer 100,000 shares of new stock to shareholders of record on May 21 at $50 a share in the ratio of one new share for four shares now held. The purchased shares will rank for dividend for the quarter ended Sept. 30, 1928.

Southern California Edison to Redeem Bonds

All of the outstanding general and refunding mortgage twenty-five year 5½ per cent gold bonds of the Southern California Edison Company, amounting to $10,225,000, have been called for payment on August 1, 1928. This is the third time within two years that the company has availed itself of the advantages of lower money rates by refunding its high yield securities. Including the bonds presently to be retired a total of $70,644,000 of the company's underlying bonds have been retired since 1926. Upon completion of this financing the total outstanding bonds will be $123,-629,700.

Utilities Power & Light Corporation Doubles Its Size and Operations

ALMOST doubling in size and earnings during the past year, the Utilities Power & Light Corporation has come forward as one of the large public utility groups of the country. Total revenue increased 87 per cent, to $27,931,465; net earnings were up 80 per cent, to $13,225,213; net income accruing to parent company common stock was $2,640,034, against $2,147,915, and the company's total assets increased from $122,067,145 to $240,878,440.


CORPORATE CHART
UTILITIES POWER & LIGHT CORPORATION
COLONIAL GAS AND ELECTRIC COMPANY
EASTERN NEW JERSEY POWER COMPANY
INTERSTATE POWER COMPANY
INDIANAPOLIS POWER & LIGHT CORPORATION
LACLEDE GAS AND ELECTRIC COMPANY
SUBSIDIARIES NOT STRICTLY UTILITIES

Utilities Power & Light shows an interesting picture of growth during the year. Population served more than doubled, to 2,100,000, the largest growth being in the production and sale of gas. Electric customers increased from 152,-996 to 230,083 and the amount of energy generated and purchased grew from 378,203,043 to 585,577,052 kw.-hr. The operating ratio increased slightly, from a low of 50 in 1926 to 52 last year. At the present time the electrical department accounts for 60.7 per cent of total business done.

Per share earnings after paying $7 on the preferred stock last year amounted to $4.44 on the average number of class A shares outstanding. At a recent price of $42 this stock is not far above ten times earnings, while the average price of holding company common stocks in the power and light industry is nearer sixteen times earnings. This, however, does not take account of class B stock. The per share earnings on the combined class A and B stock amounted to $2.13 a share. The class A stock pays $2 and the Class B $1.

Simplifies Capital Structures

Simplification of the corporate and financial structures of the Interstate Power Company was one of the year's important operations. For a considerable period the company has been acquiring new properties and consolidating them into one system. In this process fourteen hydro plants have been put in operation and 1,980 miles of transmission and 2,219 miles of distributing lines have been constructed and placed in service. In January of last year the company simplified the structures of a large group of its companies by calling and retiring twenty bond issues which bore interest ranging from 6 to 10 per cent and twelve preferred stock issues. It also liquidated nine subsidiaries.

The report for the current year to March 31, just issued by H. L. Clarke, president, showed consolidated revenues for the corporation and its subsidiaries of $28,255,087, an increase of $344,091 over the previous twelve months. Total net income for the year

was $2,884,708, after all charges, including depreciation and federal taxes, an increase of $244,674. These results do not include the operations of the Central States Utilities Corporation and the Central States Power & Light Corporation, control of which was acquired late in 1927.

Pacific Gas Earnings Show Marked Gain

Despite a material reduction in commercial lighting and domestic rates, effective during the last month of the first quarter of 1928, earnings of the Pacific Gas & Electric Company were highly satisfactory. Gross revenue for the quarter ended March 31 amounted to $14,848,009, an increase of $668,965 over the same period of 1927. Net income was $7,027,648, a gain of $649,921. After deducting for depreciation and preferred stock dividends there remained $2,317,921 for common, a gain of $564,512 over last year. This is equivalent to 3.58 per cent on the average amount of common stock outstanding during the quarter. The company's strong financial position and decline in money rates enabled it to refund higher interest bearing issues by a 4½ per cent bond issue. This resulted in a saving in interest charges during the first quarter of 1928 of $228,002.

Commenting upon the effect of rate reductions on gross, President A. F. Hockenbeamer says: "Lower oil costs, reduced money costs and other economies will offset these rate reductions to a substantial degree. Our experience has also demonstrated that increased usage follows the lowering of rates and we anticipate that this accelerated growth, aided by an energetic sales campaign, will, within a reasonable period, compensate for loss of revenue occasioned by the lower rates."

Two New Loans Floated by Foreign Utilities

First mortgage twenty-five year sinking fund 6 per cent gold bonds of the Brandenburg Electric Power Company (Märkisches Elektrizitätswerk Aktiengesellschaft) were issued during the past week to the amount of $5,000,000, the price being 93½ and accrued interest, to yield over 6.50 per cent. This company, its subsidiary and affiliated companies, serve a territory of over 13,500 square miles, practically the entire Province of Bradenburg, including important metropolitan districts of the City of Berlin, and certain districts in the adjacent provinces of Silesia, Grenzmark and Pomerania. These bonds, dated May 1, 1928, mature May 1, 1953. Proceeds will be used for the purpose of the further development of the existing power plants of the company, for further acquisitions, and for other corporate purposes.

The Tokio Electric Light Company, Ltd., made an offering of 6 per cent first mortgage gold bonds, totaling $70,000,000, the largest foreign financing of the present year. These securities, maturing in 1953, were priced at 90½ and accrued interest, to yield about 6.80 per cent. Simultaneous offerings are being made of £4,500,000 6 per cent sterling series in England and 60,000,000 yen in Japan, the aggregate principal amount of all three series being equivalent, at parity of exchange, to $121,809,250. The present financing provides for the payment of all existing bank loans and $41,519,400 of funded debt of the company and for additional capital expenditures.

Stock Quotations of Electric Light and Power and Manufacturing Companies

(Prices on New York stock market unless otherwise noted. Unless otherwise noted the par, stated, or preference value of stock is $100.)

Companies	Bid Price Tuesday June 5	Low 1928	High 1928
ABITIBI PWR. & PAPER, com., new— no par	66½	64½	85
Ala. Pwr., $7 cum. pf.—no par	m115½	114½	115½
Allis-Chalmers Mfg.,6% com.	122½	115½	129½
Aluminum Co. of Amer., com.	181	120	197½
Aluminum Co. of Amer., 6% pf.	109½	105½	110½
Amer. & Foreign Pwr., 7% pf.—no par	109	105½	110
Amer. & Foreign Pwr., com.—no par	37½	22½	38½
Amer. Bosch Magneto, com.—no par	39	15½	41
Amer. Brown Boveri Elec.†	21½	10½	26½
Amer. Brown Boveri Elec., pf. $7	58½	40½	65½
Amer. Gas & Elec., 6% pf.—no par	107½	106½	111
Amer. Gas & Elec., com. †—no par	169½	117½	184
Amer. Lt. & Trac., 6% pf.	118	116	120
Amer. Lt. & Trac., new com.	230	170	249
Amer. Pwr. & Lt., 6% pf.	107	106	107½
Amer. Pwr. & Lt., com. †—no par ex.div.	85½	62½	95
Amer. Pub. Serv., 7% pf.	a104	97½	102½
Amer. Pub. Serv., com. †	m 65	70	75
Amer. Pub. Utilities, 7% pfc. pf.	c 97	87½	97
Amer. Pub. Utilities, 7% pr. pf.	a103	95½	102½
Amer. Pub. Utilities, com.	m 50	...	...
Amer. States Sec., A.	a 11½	4	13½
Amer. States Sec., B.	a 14½	4½	17½
Amer. Superpwr., 6% 1st pf.	f102½	...	...
Amer.Super pwr., Class A†—no par	42½	36½	56
Amer.Super pwr., Class B†—no par	43½	37	56½
Amer. Wtr. Wks. & Elec., 6% pf.	103½	101½	106
Amer. W.W. & E., com. new—no par ex.div.	62	52½	70½
Anaconda Copper cap. $3	73	53½	74½
Appalachian Electric Pwr., 7% pf.	109	108½	110
Arkansas Pwr., & Lt. 7% pf	107½	107½	111
Assoc. Gas & Elec., $3.50—50	54½	...	...
Assoc. Gas & Elec., pf.—$6—no par	97	96	98½
Assoc. G. & E., Class A, 10—no par	48½	47	52½
BABCOCK & WILCOX, 7% com.	123½	117½	128
Binghamton L., H. & P., $6 pf.	107	102	109½
Birmingham Elec., pf.—$6—no par	107	104	107
Blackstone Valley G. & E., 6% pf.	m109	106	112
Blackstone Valley Gas & Elec., 10% com.—50	m165	135	170
Blaw-Knox, com.†	d101½	91	105
Brazilian Trac., Lt. & Pwr.,com.,new	f 57½	...	...
Broad River Pwr., 7% pf.	105	105	108½
Brooklyn Edison, 8% com.	252	206½	268½
Buffalo, Niagara & East. Pwr., $1.60 pf.—25	f26	....	.. .
Buffalo, Niagara & East. Pwr. com. $1.20—no par	f 43½	.....	....
CALIFORNIA ELEC. GENERATING, 6% pf.	99	98	101
Carolina Pwr. & Lt., pf.—$7—no par	f111½	109	111
Central & S. W. Util., $7 pf.—no par	a102½	99½	105½
Central & S. W. Util., pr. in. $7 pf.—no par	a109½	103½	112
Central Ark. Ry. & Lt., 7% pf.	106	105	107½
Central Ill. Pub. Serv., $6 pf.	a 99½	97½	100½
Central Ind. Pwr., 7% pf.	a100	95	101½
Central Maine Power, 6% pf.	97	96	98½
Central Maine Power, 7%	110	109	112
Central Pwr. & Lt., 7% pf.	112	104½	111½
Central States Elec., 7% pf.	116	104½	121½
Cincinnati Gas & Elec., 5% com.	g100½	...	...
Cities Service, $6 pf.—no par	f 103½	94½	103½
Cities Service, pf. B—no par	f 9½	8½	9½
Cities Service, pf. BB—no par	f 97	88½	97
Cities Service com.—20	f 71½	54	71½
Cities Service, Bks. Shrs.—10	f 35½	26½	35½
Cities Service Pwr. & Lt., 7% pf.	108½	105½	109
Cities Service Pwr. & Lt., 6% pf.	101	95½	102
Cleveland Elec. Illg., 6% pf.	113	113	115½
Cleveland Elec. Illg., 10% com.	425	350	425
Columbia Gas & Elec., 6% pf.	109½	107½	110½
Columbia G. & E. com. $5—no par	113	89½	118½
Columbus Elec. & Pwr., $2 com.—no par	n 79	66	79½
Columbus Elec. & Pwr., 7%	109	...	...
Columbus Ry., Pwr. & Lt., 7%	109	107	111
Columbus Ry., Pwr. & Lt., 7%pf. B	109	105	111
Columbus Ry., P.& L t. com. no par	125	120	125
Commonwealth Edison, 8% com.	a184	165	189
Commonwealth Pwr., 6% pf.	103½	102½	104½
Commonw'th Pwr., $2, com.—no par	82½	62½	87½
Conn. Lt. & Pwr., 8% pf.	121	120	123
Conn. Lt. & Pwr., 7% pf.	117½	118	121
Cons. Gas of N. Y., pf.	101½	101½	105
Cons. Gas of N. Y., com. $5—no par. ex.div.	158½	119½	170½
Cons. Gas, Elec. Lt. & Pwr. of Balti., 6% pf.	a111	110	114½
Cons. Gas, Elec. Lt. & Pwr. of Balti., 5% pf.	a104½	100½	105½
Cons. Gas, Elec. Lt. & Pwr. of Balti., com. $3.00—no par	e 88	67½	93
Consolidated Pwr. & Lt., 7% pf.	m105	...	...
Consumers Pwr., 6% pf.	104½	106	107
Consumers Pwr., 6.6% pf.	104½	106	107
Continental Gas & Elec., 7% pr. pf.	108	106½	108½
Conti. G. & E. com. $4.40—no par	m250	240	265
Crocker Wheeler, com.†	68	23	70
Crocker Wheeler, 7% pf.	99	...	...
DALLAS PWR. & LT., 7% pf.	110	110	111½
Dayton Pwr. & Lt., 6% pf.	109	108½	110½
Derby Gas & Elec., 7% pf.	101½	96	100½
Detroit Edison, 8% com.	205	166½	209½
Dubilier Condenser, com.—no par	4½	2½	5½
Duke Pwr., cap.	m140	130	145
Duquesne Lt., 5% pf.	m104½	104½	116½
EASTERN NEW YORK UTIL., $7 pf.	m110	111	112½
Eastern States Pwr. B	23½	11½	26½
Eastern States Pwr., pf.	m100½	98	100½
East. Tex. Elec., 7% pf.	108	106	109
Edison Elec.of Boston, $12 com.	d290	252	305
El Paso Elec. 7% pf.	111	110	112½
Elec. Bond & Share, 6% pf.	f110	108½	111½
Elec. Bd. & Sh. Sec., com. $1—no par ex. rights	f108½	76	127½
Electric Household Util.†	a 26½	13½	26½
Elec. Investors, 6% pf.—no par	103	101	104½
Elec. Investors, com.†—no par	73½	40½	79½
Elec. Pwr. & Lt., ctfs. pf.	109½	106½	110½
Elec. Pwr. & Lt., ctfs., com.—no par	40½	28½	45½
Elec. Ry. Securities, com.—no par	6½	...	...
Elec. St. Battery com. $5.25—no par	81	69	84½
Elmira Wtr., Lt. & R.R., 7% pf.	105	104	107
Empire Pwr., pfc.†	36	27½	39½
Engr. Pub. Serv. $7, pf.—no par	110½	107	110½
Engr. Pub. Serv., com.—no par	42	33	46½
Eureka Vacuum Cleaner, com. $4—no par	m75½	69	79
FAIRBANKS MORSE, 7% pf.	m109	104	114½
F.-M., com.—$3—no par	42½	32½	54
Federal Lt. & Trac.,com $1.40	55	42	56½
Federal Lt. & Trac., $6 pf.—no par ex.div.	104	98	109
Florida Pwr. & Lt., 7% pf.	m107	105	108
Ft. Worth Pwr. & Lt., 7% pf.	f114	113	114½
GALVESTON-HOUSTON ELEC. 6% pf.	80	75	85
Galveston-Hou Elec., com.	33	31½	42½
General Cable, Cl.A	74½	56	84½
Gen. Elec. $3 com.—no par	158½	124	174½
Gen. Elec., special—6%	11½	11½	11½
Gen. Gas & Elec. (Del.) com A $1.50—no par	46	35½	50½
Gen. G. & E. (Del.) pf. A.$8—no par	135	122½	144
Gen. G. & E. (Del.) pf. A $7—no par.	118	110	120
Gen. G. & E. (Del.) pf. B $7	114	104	117
Gen. Pub. Serv., $7 pf.	m117	110	120
Gen. Pub. Serv., com., no par	27½	16½	29
General Public Utilities, $7 pf.	m102	98	103
Ga. Lt., Pwr. & Rys., com.	m 58	55	65
Gt. Western Pwr., 7% pf.	h104	....	....
IDAHO PWR., 7% pf.	109	109	111½
Ill. No. Utilities, 6% pf.	m 99	96	100
Ill. Pwr. & Lt., 7% pf.	105½	103	107
Indianapolis Pwr. & Lt., 6½% pf.	107	102	107½
Indianapolis Pwr. & Lt., $7 pf.	102	100	105
Ingersoll Rand com.	92½	90	98
Int. Combus. Engr., com. $2—no par	72½	45½	72½
Int. Combustion Engr.,7% pf.	m108½	103	109
Int. Util., Class A—$3.50—no par.	48	44½	52
Int. Utilities, Class B—no par.	17½	6½	19½
Interstate Pwr., pf.—$7—no par.	104½	99	103½
Interstate Pub. Serv., 7% pf.	106	103	108
Iowa Ry. & Lt., 7% pf.	101	102	103
JERSEY CENTRAL PWR. & LT. CO., 7% pf	107	106	108
Johns-Manville. com.†—no par.	122½	111½	134

Stock Exchange: aChicago; bSt. Louis; cPhiladelphia; dBoston; eBaltimore; fMontreal; gCincinnati; hSan Francisco; iPittsburgh; jWashington; kCleveland. lBid price Wednesday, June 6. mBid price Saturday, June 2. nLatest quotations available. †Dividend rate variable.

Stock Quotations of Electric Light and Power and Manufacturing Companies (Continued)

(Prices on New York stock market unless otherwise noted. Unless otherwise noted the par, stated, or preference value of stock is $100.)

Companies	Bid Price Tuesday June 5	Low 1928	High 1928
KANSAS CITY POWER & LIGHT			
pf. $7	l110¼	109	114
Kansas Gas & Elec. 7% pf.	l110	107	110
Kelvinator Corp.	19½	11¼	22½
Kentucky Hydro-Elec., 7% pf.	m104	100	105
Kentucky Sec., 6% pf.	95	94	98
Kentucky Sec., 5% com.	150	140	150
Kentucky Utilities, 6% pf.	105	100	105
LACLEDE GAS LT., 10% com.	m220	200	260
Lehigh Pwr. Sec., com.—no par	m 40½	19¼	40½
Long Island Ltg., 7% pf.	110½	109½	112½
Long Island Ltg., 6% pf.	m107½	107	109
Long Island Ltg., com.†—no par	m250	170	250
Los Angeles Gas & Elec., 6% pf.	h110½	105¼	112¼
Louisville Gas & Elec., cl. A. $1.75	38¼	28	41
MAN. ELEC. SUPPLY, cap. $5—no par	63½	50	65½
Maytag Co., com. 50—no par	21½	30	40½
Memphis P. & L., pf.—$7—no par	110	109	111
Metropolitan Ed., pf.—$6—no par	106½	103	109½
Metropolitan Ed., pf.—$7—no par	109	109	111½
Metropolitan Ed., com. $8—no par	m170	125	185
Middle West Utilities, 6% pf.	a 99½	93½	100½
Middle West Util., 6% pr. lien	a105	99	108
Middle West Util., com. $7—no par	a153½	123½	169
Midland Utilities, pr. in. 6% pf.	a 96½	94½	97
Midland Utilities, 7% pf. A	a104½	89½	92½
Milwaukee Elec. Ry. & Lt., 7% pf.	105	100	106
Milwaukee Elec. Ry. & Lt., 6% pf.	100	98	110
Minn. Pwr. & Lt., 7% pf.	l108	107	109
Miss. River Pwr., 6% pf.	115	113½	115
Mohawk Hudson Pwr., 1st pf.—$7—no par	m107	100	110
Mohawk Hudson Pwr., 2d pf.—$7—no par	m105	100	109
Mohawk Hudson Pwr., com.—no par	44	29½	53
Montana Pwr., 5% com.	167½	102½	175
Montreal Pwr., 7% com.	f107	....	....
Mountain States Pwr., 7% pf.	m104	97	105
Mountain States Pwr., com.†	18½	....	....
NASSAU & SUFFOLK LTG., 7% pf.	110	98	110½
National Carbon, 8% pf.	a138	136½	139½
National Elec. Pwr., A†	a 36½	27½	42
National Pwr. & Lt. pf.—$6—no par	m104½	102	106
National Pwr. & Lt., com.†—no par	34½	21¼	36½
National Pub. Serv., 7% pf.	103½	99	103
National Pub. Serv., 7% ptc., pf.	n114	....	....
National Pub. Serv., A com. $1.60—no par	27½	22	29½
National Pub. Serv., B com.—no par	30½	24¼	34½
Nebraska Pwr., 7% pf.	l110	110	111½
Nevada-Calif. Elec., com.	47½	33½	50½
New Brunswick Pwr., 4% pf.	64	60	70
New Eng. Pub. Serv., pr. in. pf. $7	110	98½	110½
New Eng. Pub. Serv., pf. $7	m106	95	108
New Orleans Pub. Serv.—7% pf.	108	106	110
N. Y. & Queens Elec. Lt. & Pwr., 5% pf.	102	91	100
N. Y. Central Elec., 7% pf.	105	101	107
New York Power & Light 7% pf.	114	....	....
Niagara Falls Pwr., 7% pf.—25	m 28½	27½	29½
No. Amer., 6% pf.—50	m 58½	53½	55½
No. Amer., com.—10 ex. div.	74½	58½	78½
No. Amer. Edison, $6 pf.—no par	101½	102½	101½
Northeastern Pwr., com.	28½	19½	31
No. N. Y. Utilities, 7% pf.	108	103	109
No. Ohio Pwr., com.—no par	29	18	32
Northern Ohio Pwr. & Lt., 6% pf.	100	90	100
No. Ont. Lt. & Pr. 6% pf.	m100	94	100
No. States Pwr. (Del.), 7% pf.	108½	108½	110½
No. States Pwr. (Del.), 8% com.	143	123	152
No. Texas Elec., 6% pf.	55	45	70
No. Texas Elec., com.	19	....	....
OHIO BRASS, com. B $4—no par.	m 91	89	109½
Ohio Brass, 6% pf.	m105	106	111
Ohio Pwr., 6% pf.	108	104	109½
Ohio Pub. Serv., $6 pf.	104	95	105
Ohio Pub. Serv., 7% pf.	112	107	112
Ohio River Edison, 7% pf.	109½	106	109½
Oklahoma Gas & Elec., 7% pf.	112½	106	115½
PACIFIC Gas & ELEC., 6% pf.	27½	26½	30
Pacific Gas & Elec., 8% new com.	49	43½	53½
Pacific Pwr. & Lt., 7% pf.	l110	106	110
Packard Electric	k 65½	47	68
Penn Cent. Lt. & Pwr., $5 pf.—no par	c 80	79½	82
Penn-Ohio Edison, 6% pf. no par	99	93½	101
Penn-Ohio Edison, 7% pf.	107	106½	109
Penn-Ohio Pwr. & Lt., 7% pf.	107	99	112
Penn Pwr. & Lt.—$7—no par	l109	109½	110½
Penn Wtr. & Pwr., $2.50 com., new	e 86	68	90
Phila. Co., 5% pf.—50	m 46½	45½	48½
Phila. Co., 6% pf.—50	54	52	57
Phila. Co., com.—50	169½	145	174½
Phila. Elec., 8% com.—25	72	55½	74½
Portland Elec. Pwr., 7% pf.	105	100	104½
Portland Elec. Pwr., 6% pf.	95	78	96
Portland Elec. Pwr., 6% 2d pf.	83	55	88
Portland Elec. Pwr., com.	43	42½	52
Potomac Elec. Power, 6% pf.	l111½	....	....
Pwr. Sec., pf.—no par	60	50	68
Pwr. Sec., com.—no par	m 13½	11½	14½
Public Serv. of Colorado, 7% pf.	108	....	....
Pub. Serv. of N. J., 6% pf.	113	103½	115
Pub. Serv. of N. J., 7% pf.	129½	118	129½
Pub. Serv. of N. J., $2 com.—no par	59½	41½	66½
Pub. Serv. of No. Ill., 6% pf.	a112	110	115
P. S. of No. Ill., com. $8—no par	a182	159½	190½
Pub. Serv. of No. Ill., $8 com.	a186	159½	190
Pub. Serv. of Okla., 7% pr. in.	109	100	107
Pub. Serv. Elec. & Gas, 6% pf.	m108½	108	110½
Puget Sound Pwr. & Lt., 7% pf.	101½	92	105½
Puget Sound Pwr. & Lt., $6 pf.—no par	m100	96½	105½
Puget Sound Pwr. & Lt., com.	70	34½	84½
RADIO CORP. OF AMER., $3.50 pf.—50—ex. div.	m58½	54½	60
Radio Corp. of Amer., com.—no par.	205½	85½	224
Rochester Gas & Elec. 6% pf. D.	105½	105½	106½
Rochester Gas & Elec., 7% pf. B.	107½	105	107
Rochester Gas & Elec., 6% pf. C.	m104½	105½	106½
SAN JOAQUIN Lt. & Pwr., 7% pr. pf.	117	110	117½
St. Joseph By., L., H. & P., 5% pf.	m 75	70	75
Servel, Inc.	14½	4¼	17½
Sierra Pacific Elec., 2% com.	m 36½	29	40½
Sioux City Gas & Elec., 7% pf.	106½	100	108½
Southeastern Pwr. & Lt., pf.—$7 no par	l108½	....	....
Southeastern Pwr. & Lt., ptc. pf.	l 89½	....	....
Southeastern Pwr. & Lt., com.—no par	55½	40½	61
So. Calif. Edison, 8% pf.	49	38½	53
So. Calif. Edison, 7% pf.	29	27½	29½
So. Calif. Edison, 6% pf.	26½	25½	27½
So. Calif. Edison, 8% com.	50½	43½	53½
Southern Cities Utilities, 7% pf.	84½	75	92
Southwestern Lt. & Pwr., A $3.	80	60	80
Southwestern Lt. & Pwr., B	70	....	....
Southwestern Lt. & Pwr., $6 pf.	94	88	96½
Southwestern Pwr. & Lt., 7% pf.	m112	103	115
Standard Gas & Elec., 8% pf.	70½	65	71½
Standard Gas & Elec., 7% pr. pf.	113½	108	115
Standard G. & E., com. $3.50	69½	57½	74½
Standard Power & Light, com.	57	29½	58½
Standard Pwr. & Lt., 7% pf.	m105	98	106
Staten Island Edison, pf.—$6—no par	101	99	103½
Superheater, $6 com.—no par	150	155	178
Syracuse Lighting, 7% pf.	110	103	112½
Syracuse Lighting, 8% pf.	m120	114	121
TAMPA ELEC., com. $2.	m 68½	62	71
Tenn. Elec. Pwr., 6% pf.	102½	92	103
Tenn. Elec. Pwr., 7% pf.	109½	107	110
Tex. Pwr. & Lt., 7% pf.	l113	113½	115
Tide Water Pwr., 8% pf.	110½	108	112
Timken Roller Bear., com.—$4 no par	126½	112½	134
Toledo Edison, 7% pf.	109	103	113
Toledo Edison, 6% pf.	104	95	105
Toledo Edison, 6% com.	m145	120	150
Tri-City Ry. & Lt., 6% pf.	90	88	102
UNITED GAS & ELEC., 7% pf.	97	98	103
United Gas & Elec. (N. J.), 5% pf.	75	70	77
United Gas Impr., 8% com.—50	cl4o½	114½	149½
United Lt. & Pwr., pf.—$4—no par.	56½	52½	58
United Lt. & Pwr., pf.—$6.50—no par	a101	94½	103½
United L. & P., com. A .48—no par.	23½	13½	26½
United L. & P., com. B .48—no par.	m 25	16	30
Utah Pwr. & Lt., 7% pf.	l111	109½	112
Utica Gas & Elec., 7% pf.	105	105	106½
Utica Gas & Elec., 8% com.	m200	215	225
Utilities Pwr. & Lt., 7% pf.	103½	98	103
Utilities Pwr. & Lt., com. A $2	42	28½	45½
Utilities Pwr. & Lt., com. B $1—no par	31½	18½	32½
VERMONT HYDRO-ELEC., 7% pf.	99	95	102
Virginia Elec. & Pwr., 7% pf.	m110½	108	111
Virginia Public Service 7% pf.	102½	97	103½
WAGNER ELEC., 7% pf.	b107	96½	107
Wagner Elec., com.—no par	b 80½	37	120
Washington Ry. & Elec., 7% com.	f 450	....	....
Washington Ry. & Elec., 5% pf.	f100½	....	....
Washington Wtr. Pwr., 6% com.	225	175	235
West Penn Elec., 6% pf.	102½	100½	104½
West Penn Elec., Cl. A $7.	109½	106½	112
West Penn Pwr., 7% pf.	115½	114½	117
West Penn Pwr., 6% pf.	109½	108½	113
West Virginia Lt., Ht. & Pwr., 7% pf.	95	94	100
Western Pwr., 7% pf.	104	98	105
Western States Gas & Elec., 7% pf.	99	100	106
Western States Gas & Elec., com.	38	....	....
Westinghouse Elec. & Mfg., 8% com.—50	103½	88½	112
Weston Elec. Instrument, Cl. A $2—no par	36½	30½	36½
Weston Elec. Instrument, com.—no par	25½	12½	25½
Wheeling Elec., 6% pf.	106	95	109
Worthington Pump, 7% pf. A	m 58	46½	58½
Worthington Pump, 6% B	49½	41	51
Worthington Pump, com.	34½	28	37½
YALE & TOWNE com. $5—25.	73½	68½	84½

Stock Exchange: *a*Chicago; *b*St. Louis; *c*Philadelphia; *d*Boston; *e*Baltimore; *f*Montreal; *g*Cincinnati; *h*San Francisco; *i*Pittsburgh; *j*Washington; *k*Cleveland. *l*Bid price Wednesday, June 6. *m*Bid price Saturday, June 2. *n*Latest quotations available. †Dividend rate variable.

NORTHERN OHIO POWER & LIGHT COMPANY ELECTS NEW DIRECTORS.—At a meeting of the directors of the Northern Ohio Power & Light Company H. P. Stevens and W. L. Willkie were elected members of the board of directors to succeed J. C. Weadock and E. W. Moore.

INTERNATIONAL PAPER ORGANIZATION NEARING COMPLETION.—The organization of the new International Paper & Power Company, Boston, Mass., is being completed. The company is to acquire the International Paper Company through an exchange of stock and will also purchase the holding of John R. Macomber in the New England Power Association. The International Paper Company at the present time owns 45 per cent of this stock. The terms of exchange have not been announced, but it is understood the new company will have 7 per cent preferred stock $100 par value and no par value common stock, all of which will net old stockholders of International Paper Company stock an equal income to what has been received.

POWER CORPORATION OF CANADA INCREASES STOCK.—Stockholders of the Power Corporation of Canada, Ltd., on May 11 increased the authorized common stock, no par value, from 250,000 shares (200,000 shares outstanding) to 1,000,000 shares. There are 50,000 shares reserved for conversion of the 5 per cent debentures.

LOUISVILLE MINORITY SHAREHOLDERS DENIED PETITION.—In a decision just handed down Chancellor Wolcott of the Court of Chancery at Wilmington, Del., denied the petition of a small group of minority shareholders for an order prohibiting the Louisville Gas & Electric Company from amending its charter so as to provide for removal of the call price on the class A common stock and make a change in the dividend rights of the class A and B stocks. The amendment was authorized by the stockholders at their annual meeting held in Wilmington on May 16, but by agreement between attorneys for the company and the attorneys for the minority stockholders the filing of the certificate of amendment was postponed pending the decision of the court. Holders of approximately 95 per cent of the outstanding class B stock and approximately 70 per cent of the outstanding class A stock voted in favor of the change. The certificate of amendment will be filed immediately.

Ten Per Cent of Canadian Energy Exported

Output of Central Stations in Canada (Thousands of Kilowatt Hours)

Month	Generated—Total		Generated—Hydro		Generated—Fuel		Exported	
	1928	1927	1928	1927	1928	1927	1928	1927
January	1,318,115	1,131,212	1,297,957	1,113,899	20,158	17,313	124,019	130,894
February	1,274,120	1,065,850	1,256,268	1,050,057	17,852	15,793	122,906	121,829
March	1,332,752	1,150,008	1,314,812	1,133,785	17,940	16,223	135,910	133,702

Public Service Increases Preferred Stock

Stockholders of the Public Service Corporation of New Jersey at a recent special meeting approved a resolution recently adopted by the board of directors to amend the certificate of incorporation and authorize an increase in the outstanding preferred stock from 2,000,000 to 4,000,000 shares, all the new stock being no par value cumulative preferred stock, entitled to dividends at the rate of $5 per share per annum.

Customer-Ownership Sales

According to statistics received by the ELECTRICAL WORLD from companies taking part in customer-ownership campaigns, it is estimated that during March 172,400 shares of stock were sold, having a value of $9,720,000, in 14,500 transactions. Of this amount, somewhat more than $2,500,000 was in the form of $25 shares, the rest being sold at a price averaging very close to $100 per share.

Although this estimate may be revised upon the receipt of reports from a number of companies which were not in hand at the time the compilation was made, it is clear that there was a marked reduction in this form of financing during February and March. February sales, valued at $8,856,012, were somewhat below those of September, 1927, the last previous low month, and March sales show less than 10 per cent increase over February.

POWER IN CANADIAN MINING.—The growing use of water power in connection with mining developments in Canada is aptly illustrated in a report compiled by the Natural Resources Branch of the Interior Department. This report summarizes the location of important mining developments with the associated hydro-electric projects; it states that while no authoritative compilation of the amount of power used in the mining and metallurgical treatment of minerals in the Dominion has been published since 1924, when a total of 277,600 hp. was reported, it is probable that this figure now exceeds 400,000 hp. This involves a capital investment of approximately $75,000,000 in central electric stations for mining purposes alone.

SOUTHERN CITIES UTILITIES INCREASES PRIOR PREFERRED.—The Southern Cities Utilities Company has increased its authorized $6 prior preferred stock from 30,000 to 100,000 shares.

Oregon Great Power State

The potential water-power resources of Oregon amount to 3,665,000 hp., as estimated from the stream flow available 90 per cent of the time, or 5,890,000 hp. as estimated from the flow for 50 per cent of the time, if storage is provided in feasible reservoir sites, according to a statement made public by the Department of the Interior based on field work and studies of the Geological Survey. Thus far only about 3 per cent of these water-power resources has been utilized; with complete development the installed capacity of waterwheels might be about 8,000,000 hp., or two-thirds as much as the present capacity of water-power installations in the whole United States.

Based on the flow available 50 per cent of the time, the estimated power within the state on certain rivers is:

	Horsepower
Columbia River	1,408,000
Klamath River Basin	132,000
Umpqua River Basin	561,000
Rogue River Basin	532,000
Snake River Basin	823,000
Deschutes River Basin	734,000

CONSOLIDATED GAS COMPANY (BALTIMORE) PAYS DIVIDEND ON NEW STOCK.—The directors of the Consolidated Gas, Electric Light & Power Company of Baltimore have recently declared an initial quarterly dividend of 1¼ per cent on the 5 per cent preferred stock, series A, payable July 2.

CENTRAL STATES EDISON BONDS LISTED. — The Baltimore Stock Exchange has authorized the listing of $1,350,000 first lien 5½ per cent gold bonds, series A.

Security Issues of Electric Service Companies in May

Name of Company	Amount of Issue (Par Value)	Period Years	Class	Purpose	Interest Rate	Price	Per Cent Yield
Columbus Electric & Power Co.	$2,500,000	5	Gold coupon notes	To retire notes	4½	97.80	5
Gulf States Utilities Co.	2,940,000	..	Preferred stock	To liquidate floating debt of the company and for other corporate purposes	5½	98	5.61
Illinois Power & Light Corp.	36,474,000	..	Cumulative preferred stock	To retire preferred stock	6	100	6
Puget Sound Power & Light Co.	10,560,000	..	Prior preference stock	To retire preferred stock	5	96	5.20
Southern Cities Utilities Co.	10,500,000	30	First lien and collateral trust gold bonds, series A	To retire funded debt, to acquire or retire funded debt and preferred stock of subsidiaries and for other corporate purposes	5	94	5.40
Rumford Falls Power Co. (Maine)	2,000,000	20	General mortgage gold bonds	Proceeds will be used to retire maturing bonds	4½	98½	4.60
American Power & Light Co.	19,000,000	..	Preferred stock, series A, stamped certificates		5	95	5.25
American Commonwealths Power Corp.	4,500,000	25	Gold debentures	For acquisition of stock and for other corporate purposes	5½	96½	5.75
American Gas & Power Co.	6,500,000	25	Secured gold debentures	To reimburse for cost of its holdings	5	95½	5.30
Public Utilities Consolidated Corp.	1,500,000	10	Secured convertible gold bonds	To retire funded debt of subsidiaries for the acquisition of additional properties and for other corporate purposes	6	98	6.25
	4,000,000	20	First mortgage gold bonds		5½	97	5.75
Islands Edison Co.	2,250,000	25	Sinking fund secured gold bonds, series A	To purchase new company	5½	96	5.80
Indiana Electric Corp.	3,268,000	23	First mortgage and refunding gold bonds		5	100	5
Electric Public Utilities Co.	3,000,000	3	Gold notes	To retire maturing obligations and for general corporate purposes	5	97¼	6
Associated Gas & Electric Co.	2,650,000	40	Gold debenture bonds	Proceeds to be used for retiring or acquiring bonds and preferred stocks of company and subsidiaries	5	100	5
Central Indiana Power Co.	3,000,000	2	Gold notes	Refunding and to reimburse for advances made or to be made to subsidiaries, for extensions and improvements	4½	99.06	5.03
Indiana Hydro-Electric Power Co.	3,000,000	30	First mortgage gold bonds, series A	To retire outstanding bonds	5	99½	5.03
Southern Cities Utilities Co.	3,000,000	30	Sinking fund gold debentures, series A	To retire securities and to acquire new properties	6	99½	6.03
Texas-Louisiana Power Co.	1,700,000	14	Gold debentures, series A	Acquisitions and improvements	6	100	6
	1,000,000	..	Cumulative preferred stock		7	101	6.93

Total ..... $123,342,000 (par value)
Total amount actually realized $120,375,100
Rights $1,405,700
Total financing for May $121,780,800

Business News and Market Conditions

ACTIVE buying in the Eastern district, with an increase of inquiries in New England; reasonably satisfactory conditions in the Middle West, including the territory served largely from St. Louis, where the refrigerator demand is especially good—as it is also in the Southeast—and a big program of construction in California, with somewhat less cheerful reports from the Puget Sound region—this about summarizes market conditions as reported for the first part of the current week. Line material for service extensions is moving in New England. Electrical specialties in other Eastern states operate under a fair demand, though the cool weather is holding back the market for fans. May held its own well in the Great Lakes States. Meters and distribution transformers are reported from Atlanta as in active demand. Extensive street-lighting projects are under way in various cities on the Pacific Coast. Altogether, optimists find no reason for modifying their views or pessimists for applauding their own acumen.

Inquiries Increase in New England

Manufacturers of New England report an increase in negotiations and a general quickening in activity in industrial equipment sales. Motor sales are well up, amounting to over $50,000 and meeting the level in volume reported a year ago. Fractional-horsepower motors are ahead of last year in sales volume. The demand for large-rating motors for loom drive and rolling operations is noted, a number, of 50-hp. and 75-hp. ratings, having been ordered during the week.

Central-station supplies are steady. According to one prominent manufacturer the demand for scheduled plant equipment, watt-hour meters, regulators, control and switch apparatus is encouraging. Two such orders for southern New Hampshire total about $8,000, one for Maine $2,000, and equipment for two Massachusetts plants $2,500. Line material for service extensions is moving. During the week two cars of material, poles, cross-arms and wire were shipped to northern New England and orders are pending for similar mate rials for southern Massachusetts. New constructions are heavy for residential and mercantile types. Appliance sales are at an even level as compared with last week. New projects include reorganization and installation of rayon products equipment in New Bedford, where the Delaware Company is planning extensive operations; a large laundry, to cost $300,000, at Quincy; a small refrigerator plant, $30,000, for the Cudahy Packing Company, Brockton; street signals, Boston, $250,000; Boston & Maine terminal warehouse, $3,000,000. In addition the Grafton (N. H.) Power Company has filed plans for development of 220,000 hp. (involving ultimately $40,000,000) at Fifteen-Mile Falls, adjacent to Littleton, N. H., on the Connecticut River. Other construction projects follow:

The Hartford Electric Light Company, Hartford, Conn., will make extensions in its power plant to cost $200,000. Springfield, Mass., plans an improved lighting system. The Public Service Company of New Hampshire, Manchester, N. H., will build a transmission line, 35 miles long, from Bristol to Ossipee and Conway, N. H.

Buying Continues Active in Eastern District

Industrial buying is expanding in the Eastern district, with motor account developing a high level as a result of the greater variety of industries now in the market. Central-station business is satisfactory and shows signs of greater volume of commitments at an early date. A prominent manufacturer of turbo-generators and other prime movers reports contracts for equipment from two power companies in the South totaling close to $1,000,000. Metropolitan utilities continue their purchases of transformers and other substation apparatus for early delivery. A manufacturer of switching equipment states that sales show a decline in volume for the second quarter of the year, with indications for improvement during the third quarter. A municipality in Kansas has placed an order for several 200-kva. transformer units with a Pittsburgh maker. A cement mill in Wyoming has contracted with a leading manufacturer for motor-generator sets, as well as for about 50 induction-type motors. Cold-storage and meat-packing plants have been active in the market for motors for refrigerating service, varying from 30-hp. to 50-hp. rating. Motors for oil-burner installations show a tendency to lag, following sizable business in recent weeks. Smaller motors are in good demand from the shoe machinery and sewing-machine trades.

Electrical specialties in general are operating under a fair demand. Refrigerating units for domestic service are enjoying an active call and good turnover is current. Electric fans continue sluggish and present business is far from satisfactory. Elevator business is developing an improved tone, and a leading manufacturer in the New York district reports orders from apartments and commercial buildings varying from $25,000 upward for individual installations. According to a prominent producer of marine electric equipment, the immediate outlook in this line is promising. A transoceanic steamship company has contracted with an American manufacturer for a complete electric power plant for a new vessel of 19,000 tons rating now being built in England, the order including all main propelling machinery. There are several large orders pending with railroads for electrical equipment which are expected to mature within 60 to 90 days. Immediate construction activities in the Eastern district include the following:

The New York Edison Company has plans for an addition to its substation on East Thirty-ninth Street, New York, extending through to East Fortieth Street. The Yonkers Electric Light & Power Company has filed plans for an equipment storage and distributing plant to cost about $200,000. The Packard Motor Car Company will proceed with an eight-story service, repair and distributing plant on Eleventh Avenue, New York, to cost more than $1,500,000. Buffalo is having plans prepared for a vocational school to cost close to $1,000,000. The American Encaustic Tiling Company will build an addition to its plant at Maurer, N. J., to cost more than $100,000. The Public Service Electric & Gas Company will install an ornamental lighting system at Westfield, N. J. The Bureau of Yards and Docks, Navy Department, Washington, is asking bids until June 20 for ice-making and refrigerating machinery for naval air station at Lakehurst, N. J. (Specification 5423). The Quartermaster, United States Army, will rebuild and carry out expansion at the Picatinny Arsenal, near Dover, N. J., to cost about $1,500,000. Eternit, Inc., Philadelphia, manufacturer of asbestos shingles, is making plans for a new plant at Houston, Tex., to cost in excess of $1,000,000. The Pennsylvania Power & Light Company is merging 35 light and power utilities in several counties and will make extensions in transmission lines; this company will also install an ornamental lighting system at Berwick, Pa. John B. Sener & Sons, Kinzer, Pa., plan rebuilding of planing mill and lumber plant recently destroyed by fire with loss of about $100,000. Department of Public Welfare, Pittsburgh, is asking bids until June 21 for power equipment, power lines; ground lights, etc., at institution at Mayview. The Prudential Refining Company, Baltimore, will make extensions and improvements in oil-refining plant to cost more than $500,000. The Bureau of Fisheries, Washington, is asking bids until June 28 for one full-Diesel heavy-duty direct-connected reversible-type marine engine, 150 hp., for a power vessel at the Boothbay Harbor (Me.) fisheries station.

No Apprehension Felt in Middle West

Comparatively good business continues in most sections of the Middle West. The slight acceleration of business noticeable at the beginning of May continued throughout the month and the consensus of opinion seems to be that May closed as favorably as could be expected. Apparently there is no reason for apprehension with regard to business conditions for the coming months, as each month of the year so far has seen some improvement. The condition of the steel, automobile, agricultural and railroad industries is encouraging, and indications seem to point to better busi-

ness conditions as the year goes on. A larger amount of building construction is under way, with improved conditions among industrials and some reduction in the numbers of unemployed. The various utility companies are busy, a good deal of underground construction work going on. Maintenance purchasing was not quite so heavy this week, although the volume of business is practically the same. Jobbers' sales continue to hold up fairly well. Most appliances are moving in fair volume, with a particularly good demand noted for the smaller appliances of the gift type. The usual opening of the fan season has been delayed owing to the cool weather. Prices remain generally firm. Coming construction includes:

The Pera Pine Company, Rockford, Ill., plans a furniture-polish manufacturing plant to cost $80,000. The Southern Indiana Gas & Electric Company, Evansville, Ind., will make extensions in its power plant and system to cost $350,000. The Major Brothers Packing Company, Mishawaka, Ind., will soon take bids for an addition to cost $350,000. The Calumet & Hecla Company, Calumet, Mich., will install additional equipment at its copper properties, to cost $500,000. The Midland Steel Products Company, Detroit, plans an addition to cost $250,000. The Chrysler Motor Corporation, Detroit, plans a plant to cost $500,000. The Minnesota Power & Light Company, Duluth, Minn., will soon take bids for an equipment storage and distributing plant to cost $140,000. The Abbott Memorial Hospital Association, Duluth, Minn., will soon take bids for a power plant and a hospital addition, to cost $600,000. Wayne, Neb., will build a municipal power plant. The Seiberling Rubber Company, Barberton, Ohio, plans an addition to cost $160,000. The State Department of Public Welfare, Columbus, Ohio, will receive bids until June 14 for an ice plant at Gallipolis, Ohio, to cost $50,000. The Selby Shoe Company, Portsmouth, Ohio, plans an addition to cost $125,000. Urbana, Ohio, is considering a municipal electric light and power plant to cost $500,000. John Morrell & Company, Sioux Falls, S. D., will build an addition to their meat-packing plant to cost $250,000. The Wisconsin Power & Light Company, Madison, Wis., will soon take bids for a power plant at Janesville, Wis., to cost $100,000. The Bergstrom Paper Company, Neenah, Wis., will build an addition to its power plant, to cost $80,000. The Nekoosa-Edwards Paper Company, Nekoosa, Wis., plans an addition to cost $1,000,000. The Wisconsin Power & Light Company, Madison Wis., plans an equipment storage and distributing plant at Portage, Wis., to cost $30,000. Chicago and Lincoln, Neb., plan ornamental lighting systems.

Good Refrigerator Demand in St. Louis Section

Slight change is noticed in business conditions in the St. Louis territory since the last report. No orders of contract size have been placed, but there is a somewhat better demand for stock sizes of apparatus. Unfavorable weather seems to have reduced the movement of transmission line supplies. A good volume of building construction materials is being shipped. Manufacturers of refrigerators report the demand holding up well. Coming construction includes:

The Hot Springs (Ark.) Public Utilities plans expansion in substation and distributing facilities to cost $45,000. The United States Cold Storage Company, Kansas City, Mo., plans a cold-storage plant to cost $1,000,000. The Union Electric Light & Power Company, St. Louis, plans a substation at 1408 Clark Street, to cost $35,000. The Oklahoma Gas & Electric Company, Oklahoma City, has acquired the municipal power plants at Elmore City and Calera, Okla., and plans transmission-line construction. The Western Light & Power Company is negotiating for the purchase of the municipal power plant at Woodward, Okla. The Texas Central Power Company has secured permission to build a hydro-electric power plant on the Guadalupe River, near Cuero, Tex. The Texas Utilities Company, Plainview, Tex., is planning a superpower plant to cost $750,000. Stamford, Tex., plans extensions in its municipal power plant. The Louisiana Power & Light Company, New Orleans, plans extensions in transmission lines to Ferriday and Vidalia, La., and vicinity. The Public Service Company of Oklahoma, Tulsa, Okla., will build a transmission line from Nowata to Bartlesville, Okla., and install a substation at Nowata to cost $50,000. The West Texas Utilities Company, Abilene, Tex., plans a 10-mile 6,600-volt transmission line from Wellington to Dodsonville, Tex. The Texas Electric Service Company, Dallas, Tex., will build a 60,000-volt transmission line between McCamey and a point near Chalk Oilfield, in the vicinity of Big Springs. Dallas, Tex., plans an ornamental lighting system on the Fort Worth-Dallas Pike.

Pacific Coast to See Extensive Construction

Much large construction has just been announced in California. The Carquinez Straits train ferry, operated by the Southern Pacific Railroad since 1869, is to be replaced by a ten-million-dollar bridge 1¼ miles long with an electrically raised lift span to be 135 ft. above water level. A half-million-dollar glass factory is to be built at Vernon, and a Pittsburgh plate-glass concern is to build a plant in South San Francisco. Ecclesiastical construction includes $1,000,000 to be spent on the Sacred Heart Academy in Los Angeles, $300,000 for the Holy Cross Hospital in Fresno, $500,000 for a Los Angeles synagogue, and a drive is now on in San Francisco to get funds for the Episcopal Cathedral there, which will cost $3,500,000. School construction includes new high schools and additions for Placerville, Redwood City and Inglewood, averaging $400,000 each, while Alhambra has raised $1,400,000 for junior and senior high-school systems. Street-lighting projects include Tulare, with 28 single standards, awarded at $6,000; Torrance, estimated at $110,000; 116 standards for seventeen blocks in Bakersfield, awarded at $28,000; a system for San Leandro, estimated at $20,000; a duplex-light extension to the San Jose system and a single-light extension to the Sacramento system. Miscellaneous large construction includes a 300-kw. unit plant for the city of Alturas, the new Morgan Hill substation for the Pacific Gas & Electric Company, containing four transformers of 11,000 kva. each; an addition to a South San Francisco steel plant containing a 225-hp. synchronous motor and accessories; a market for Oakland to cost $750,000; the half-million-dollar Parr terminal in Richmond and a hotel for Tiajuana, estimated to cost $750,000.

General let-down in business is being experienced in the Puget Sound district with no definite explanation as regards the reason. However, indications for summer business are said to be comparatively bright, with orders of considerable magnitude in the immediate offing, these to emanate from lumber-mill and pulp and paper manufacturing sources. Last week's volume included about 80 small motors, from 100 hp. down, for pumping plants, cold-storage and lumber mills. Seattle's building permits for the first five months of the year show an increase in excess of $4,000,000 over the like period last year. Coming construction follows:

The Southern California Edison Company, Los Angeles, plans a substation on Madrid Street, Torrance, Calif. Idaho Falls, Idaho, is arranging bonds for $100,000 for a hydro-electric power plant on the Snake River. Nashua, Mont., plans a transmission line to connect with system of Montana Power Company at Glasgow, Mont. The Rocky Mountain Power Company, Butte, Mont., has applied for permission to build a hydro-electric power plant on the Flathead River, near Polson, Mont., to cost $1,000,000, with transmission line. Tacoma, Wash., plans a transmission line from the municipal power development at Cushman to Nisqually substation to cost $63,000. The Grays Harbor Pulp & Paper Company, Hoquiam, Wash., will build a transmission line from its power plant to the East Hoquiam Valley section. The National Paper Products Company, San Francisco, plans a unit at the Kraft paper mill at Port Townsend, Wash., to cost $1,500,000. The Moreland Truck Company, Los Angeles, is planning a motor-truck assembling plant at Seattle to cost $100,000. Sellers & Stone, Yakima, Wash., plans a cold-storage plant to cost $100,000. Cardiff, Monrovia and Pasadena, Calif., plan ornamental lighting systems. Santa Ana, Calif., plans an ornamental lighting system to cost $100,000.

Quiet Market with Active Spots in Southeast

Activities in the electrical field in the Southeast have been quiet during the past week, a reasonable volume of business having been sustained by small-size orders. There is a more active demand for meters and distribution transformers, the largest individual transformer order last week coming from Mississippi and amounting to $15,000. In the past ten days one power company has ordered switching equipment totaling $10,000 and creosoted pine poles amounting to $5,300. Some other central-station orders include line construction materials amounting to $5,000, distribution transformers at $3,200 and metal conduit at $3,000. One of the larger power companies has sold $391,000 of electric refrigerators in the past 27 selling days, with the campaign to run 26 days longer. Another of the larger com-

panies is this week getting under way with a large refrigerator campaign and has just completed an electric range campaign in which 1,115 ranges were sold in 40 working days.

Building permits in Atlanta for May amounted to $5,800,000, which is the highest monthly total in the city's history. Municipalities are ordering in less volume than has been the case in recent months, though one town ordered last week one carload of creosoted pine poles and another town is in the market for "white way" equipment costing in the neighborhood of $10,000. A town in Louisiana ordered in the past few days "white way" equipment amounting to $7,000. Such equipment is in active demand over the territory generally, but the individual orders are averaging only $1,000 each. New projects include:

Swift & Company, Chicago, will build a lard plant at Jacksonville, Fla., to cost $250,000. The Georgia Manganese & Iron Company, Hurt Building, Atlanta, plans a plant at Cartersville, Ga., to cost $1,000,000. Quartermaster, Fort Benning, Ga., will receive bids until June 15 for insulators, switches, reflectors and other electrical supplies (Circular 97). The Lexington (Ky.) Utilities Company is arranging for the purchase of the Georgetown (Ky.) Water, Gas & Electric Power Company. The Adrian Knitting Mills, Dyersburg, Tenn., plan a mill unit to cost $125,000. The Arrington Cold Storage Company, Arrington, Va., will build a cold-storage plant, to cost $200,000. The East Coast Utilities Company, Richmond, Va., will make extensions in the transmission lines in Matthews County. New Martinsville, W. Va., has voted bonds for $125,000 for a municipal light and power distributing system. The Universal Glass Products Company, Parkersburg, W. Va., plans an addition to cost $150,000. Greenville, Miss., plans a municipal light and power plant. The Mississippi Power Company, Gulfport, Miss., will make extensions in its ornamental lighting system at Meridian, Miss., to cost $35,000. The Stowe Thread Company, Belmont, N. C., plans a mill unit to cost $100,000. Corinth, Miss., and West Palm Beach, Fla., plan ornamental lighting systems.

Copper and Lead Active at Unchanged Prices

The week ended Wednesday was characterized by better than average volume of sales of lead and copper, with substantially the same prices as obtained a week ago. Zinc continues dormant, also with practically no change in price.

NEW YORK METAL MARKET PRICES

	May 29, 1928 Cents per Pound	June 6, 1928 Cents per Pound
Copper electrolytic	14.525	14.525
Lead, Am. S. & R. price	6.30	6.30
Antimony	11.0	10.50
Nickel, ingot	35	35
Zinc spots	6.475	6.487
Tin, Straits	50.625	49.50
Aluminum, 99 per cent.	24.30	24.30

Base copper wire price June 6, 1928, 16½ cents.

Both tin and silver are lower, prompt Straits tin having been continuously below 50 cents for the first time in four years. The reaction in silver to close to 60 cents is perhaps only natural after the recent rapid advance.

Activities of the Trade

Berger Brothers Buy Motor Department in Toledo

The purchase of the motor department of the Lake States General Electric Company, formerly the Nagle Electric Company, of Toledo, Ohio, is announced by Berger Brothers, 91 St. Paul Street, Rochester, N. Y. The motor department will be located at the same address, 34 St. Clair Street, Toledo, and will operate under the name of the Fred W. Kiemle Company. The business will be conducted in the future, as it has been in the past, under the supervision of Mr. Kiemle, who is vice-president and general manager. It is said that the affiliation with Berger Brothers will permit the handling of purchases and sales of used equipment on a much larger scale than in the past.

Berger Brothers also announce that after Sept. 1 they will be located in a new and larger plant at 1350 University Avenue. At the new plant the company will have 35,000 sq.ft. of floor space and every modern facility, including craneways, cranes and larger railroad sidings.

Dudlo Manufacturing Adopts New Shipping Method

Instead of shipping wire on spools, with the consequent higher shipping cost and the necessity of handling and returning empty spools, the Dudlo Manufacturing Corporation, Fort Wayne, Ind., has developed the Dudlo demountable spool. The wire is properly spooled at the mill, tied, removed from the spools and shipped in condition for unspooling by the customer through the use of the demountable spool. The company claims a number of advantages for this method of handling, including the release of capital tied up in spools and the reduction of handling costs.

THE AUTOMATIC ELECTRIC HEATER COMPANY, 1505 Race Street, Philadelphia, is now offering its "Sepco" line of water heaters in colors to meet the present-day trend of color in the home.

THE DELTA-STAR ELECTRIC COMPANY, 2400 Block, Fulton Street, Chicago, manufacturer of high-tension equipment, announces that it is now offering a new line of unit type low-voltage spool-insulating supports.

THE AMERICAN TRANSFORMER COMPANY, Newark, N. J., announces the appointment of the following district representatives: L. C. Herrmann, 4433 North Richmond Street, Chicago; H. C. Boulton, 1988 East 66th Street, Cleveland; Congleton Engineering Company, 914 Main Street, Cincinnati; Herr-Harris Company, 910 Fulton Building, Pittsburgh; L. D. Joralemon, 112 South Sixteenth Street, Philadelphia; W. O. Taylor & Company, Ltd., 415 Canada Cement Building, Montreal, Canada; Elliott Equipment Company, 708 Sixth Avenue, South, Minneapolis, Minn.; Arthur L. Pollard, Knoxville, Tenn.; James H. Southard, 682 Mission Street, San Francisco, and J. W. Jones, 432 Pennant Building, St. Louis.

THE C. O. BARTLETT & SNOW COMPANY, Cleveland, manufacturer of material-handling equipment, announces the appointment of J. R. Allison as its representative in Pittsburgh with headquarters at 406 Bessemer Building. Mr. Allison was formerly with the Carnegie Steel Company in the construction department of the Homestead Steel Works of that company.

THE BOTFIELD REFRACTORIES COMPANY, Swanson and Clymer Streets, Philadelphia, manufacturer of "Adamant" firebrick cement, announces that since June 1, the distribution of its products in Toledo, Ohio, and vicinity has been handled by the Builders' & Industrial Supply Company, 4090 Detroit Street, Toledo, Ohio.

THE INGERSOLL-RAND COMPANY, 11 Broadway, New York City, has received an order for three oil engines for use in connection with three 300-hp. oil-electric locomotives which are being built jointly by the Ingersoll-Rand Company, the General Electric Company and the American Locomotive Company. These locomotives are being built for the Ashland division of the American Rolling Mill Company.

THE NORTHERN ENGINEERING WORKS, Detroit, manufacturer of cranes and hoists, has appointed the Interstate Supply Company, Commercial Trust Building, Philadelphia, as direct factory representative for the Philadelphia district. W. H. Beyer of the latter company, formerly connected with the Philadelphia office of Manning, Maxwell & Moore, will be in charge.

THE PHILADELPHIA ELECTRICAL & MANUFACTURING COMPANY, 1228 North 31st Street, Philadelphia, has placed on the market the "Pemco" electric water heater, in which the current passes directly through the cold water. For normal use a single-plate electrode takes the load, while for large load demands a second set of electrodes goes into action automatically. The manufacturer claims high efficiency for this method.

THE WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY has appointed J. K. B. Hare as assistant central-station sales manager of the company. He will be associated with G. E. Wearn, central-station sales manager, and will have his headquarters at the company's office at 150 Broadway, New York City. Mr. Hare has been with the Westinghouse interests for the past sixteen years, with the exception of two years of army service during the war.

Electrical Patents

Announced by U. S. Patent Office

(Issued May 15, 1928)

1,669,515. CURRENT TRANSFORMER; J. B. Gibbs and G. A. Burr, Wilkinsburg, Pa. App. filed Sept. 6, 1923. For outdoor use.

1,669,516. AUTOMATIC RECLOSING CIRCUIT INTERRUPTER; L. R. Golladay, Wilkinsburg, Pa. App. filed Nov. 2, 1921.

1,669,518. ELEVATOR CONTROL SYSTEM; R. P. Higbee, Wilkinsburg, Pa. App. filed May 24, 1923.

1,669,519. MEASURING DEVICE; F. W. Hild, Los Angeles, Calif. App. filed Jan. 25, 1923. For use in connection with control systems for oil-well, and other earth drilling and similar operations.

1,669,520. THERMAL RELAY; H. D. Hineline, Pittsburgh, Pa. App. filed Feb. 3, 1923. Cartridge type.

1,669,521. THEATER DIMMER AND THE LIKE; R. B. Hunter, Milwaukee, Wis. App. filed Nov. 26, 1923.

1,669,522. TURBINE-GOVERNING SYSTEM; W. Innes, Monkseaton, England. App. filed Aug. 3, 1923.

1,669,524. SPEED-CONTROL SYSTEM FOR HIGH-FREQUENCY GENERATORS; S. M. Kintner, Pittsburgh, Pa. App. filed Nov. 2, 1921.

1,669,527. METHOD OF AND APPARATUS FOR PRODUCING MODIFIED CURRENTS, ETC.; F. W. Meyer, Schenectady, N. Y. App. filed Feb. 1, 1918.

1,669,529. INSULATOR; F. H. Miller, Wilkinsburg, Pa. App. filed Sept. 19, 1922. High-potential insulator of the suspension type.

1,669,531. ELECTRIC SWITCH; A. J. Mottlau, Pittsburgh, Pa. App. filed April 9, 1927. Quick-break-and-make type.

1,669,544. THERMAL CONTROL DEVICE; C. Aalborg, Wilkinsburg, Pa. App. filed Sept. 3, 1919.

1,669,545. SWITCH; C. Aalborg, Pittsburgh, Pa. App. filed July 31, 1924. For use in the handles of vacuum cleaners.

1,669,546. CIRCUIT INTERRUPTER; C. Aalborg, Pittsburgh, Pa. App. filed Feb. 12, 1925. High-speed.

1,669,548, 1,669,549. ELECTRICAL FIXTURE-SUPPORTING DEVICE; R. B. Benjamin, Chicago, Ill. Apps. filed July 1 and 23, 1921.

1,669,558. MOTOR-CONTROL SYSTEM; W. L. Hartzell, Pittsburgh, Pa. App. filed Sept. 12, 1921. Employed in the drilling of oil wells.

1,669,560. UTILITY DRIVE; W. H. Himes, Pittsburgh, Pa. App. filed Feb. 18, 1925. Power drive for implements.

1,669,564. BURGLAR-ALARM SYSTEM; W. E. Jones, Hennepin, Minn. App. filed May 15, 1920.

1,669,570. TERMINAL COVER; W. G. Mylius, Wilkinsburg, and B. G. La Bar, Turtle Creek, Pa. App. filed Nov. 14, 1925.

1,669,572. ELECTRICAL MEASURING INSTRUMENT; C. Oman, Swissvale, Pa. App. filed Feb. 3, 1925. Polyphase induction watthour meter.

1,669,576. ROTARY PHASE CONVERTER FOR CONVERTING ALTERNATING CURRENT; M. Schenkel, Berlin-Charlottenburg, Germany. App. filed July 23, 1925.

1,669,577. FREQUENCY CONVERTER OF ASYNCHRONOUS CONSTRUCTION; M. Schenkel, Berlin-Charlottenburg, Germany. App. filed July 23, 1925.

1,669,582. TEMPERATURE-CONTROL SYSTEM; S. A. Staege, Pittsburgh, Pa. App. filed July 23, 1925. For controlling the temperature of a dryer unit.

1,669,588. ELECTRIC HEATER; E. G. Burns and J. A. Davis, Sacramento, Calif. App. filed Nov. 3, 1925.

1,669,608. THERMOSTATIC SWITCH; F. F. Forshee, Mansfield, Ohio. App. filed May 20, 1926.

1,669,609. REGULATOR SYSTEM; C. LeG. Fortescue, Pittsburgh, Pa. App. filed March 18, 1925. For regulating the excitation current of dynamo-electric machines.

1,669,619. ELECTRIC METER; A. J. Lush, Waltham, Mass. App. filed April 9, 1925. Of the double-pivot type.

1,669,626. AUTOMATIC CUT-OFF PLUG FOR ELECTRIC IRONS; B. F. Ordway, Pasadena, Calif. App. filed Sept. 9, 1925.

1,669,660. WELDING ROD; J. Birchard Green, Chicago, Ill. App. filed March 19, 1926. For metallic arc welding.

1,669,661. COATED FILLER MATERIAL; J. B. Green, Chicago, Ill. App. filed Feb. 28, 1927. For fusion welding and cutting by the arc process.

1,669,666. ELECTRICAL WALL SOCKET; H. F. Laub, Logan, Utah. App. filed July 3, 1923.

1,669,687. RHEOSTAT-ARM MOUNT; H. E. Adams and H. L. Decker, Toledo, Ohio. App. filed July 16, 1926. Liquid lever indicators of the type having a float actuated rheostat.

1,669,702. FUSE BOX; A. F. Euchenhofer, Dayton, Ohio. App. filed Oct. 21, 1920.

1,669,719. CONDUCTOR SUSPENSION APPARATUS; J. R. Marshall, McKean, Pa. App. filed Oct. 5, 1925.

1,669,770. TIME SWITCH; J. C. Miller, Oak Park, Ill. App. filed Dec. 24, 1925.

1,669,773. ELECTRICALLY HEATED BATHTUB; K. H. Ober, Baltimore, Md. App. filed April 13, 1926.

1,669,802. ELECTRIC STOVE; C. C. Armstrong, Huntington, W. Va. App. filed Aug. 3, 1925.

1,669,849. CIGAR LIGHTER; C. Baia, West New York, N. J. App. filed Aug. 4, 1925.

1,669,938. VERTICAL PUMP MOTOR WITH TOP ADJUSTMENT; C. E. Johnson and E. Mendenhall, Los Angeles, Calif. App. filed July 2, 1925.

1,669,964. ELECTRICAL WATER HEATER; B. Barry, Mount Eden, Auckland, N. Z. App. filed June 19, 1926. In which heating element containers are inserted into a water circulating container.

1,669,972. RECIPROCATING-BED PRINTING PRESS; C. B. Cottrell, 3rd, Westerly, R. I. App. filed July 9, 1924.

1,669,995. WATER PURIFIER; W. M. Myers, St. Joseph, Mo. App. filed May 28, 1927.

1,670,009. CONTACT CLAMP; P. A. Sawyer, Hasbrouck Heights, N. J. App. filed April 9, 1925. For use in connection with lead-in or ground wires as applied to telephone or wireless telephone connections.

1,670,030. NONSYNCHRONOUS MOTOR; V. A. Fynn, St. Louis, Mo. App. filed July 5, 1924. Improvement or control of the power factor or to the compensation of such motors.

1,670,031. SYNCHRONOUS MOTOR; V. A. Fynn, St. Louis, Mo. App. filed Oct. 22, 1926.

1,670,032. ELECTRIC WATER HEATER; A. J. Gibbons, Indianapolis, Ind. App. filed June 5, 1926.

1,670,040. DRY CELL; E. H. McCabe, Madison, Wis. App. filed Dec. 22, 1924.

1,670,046, 1,670,047. BATTERY PLATE AND METHOD OF MAKING SAME; W. J. Plews, Detroit, Mich. Apps. filed June 27, 1921 and Dec. 29, 1927.

1,670,052. ELECTRODE MASS FOR SELF-BAKING ELECTRODES; C. W. Soderberg, Oslo, Norway. App. filed July 22, 1924.

1,670,063. LOAD-CONTROL SYSTEM; A. G. Darling, Schenectady, N. Y. App. filed June 30, 1926. Which permits the plant to fully utilize the waste heat energy in certain forms of cheap fuel resulting as a by-product from industrial operations, in the generation of motive fluid for the prime movers, while the plant is interconnected with other sources of electrical energy in a power supply system.

1,670,073. ROTARY SNAP SWITCH; L. A. Kempton, Bridgeport, Conn. App. filed Dec. 16, 1926.

1,670,075. CLOTH OR FABRIC; T. H. McComsey, Los Angeles, Calif. App. filed Aug. 18, 1925. Adapted for use in the manufacture of electro-magnetic therapeutic devices such as blankets, pads, garments and the like.

1,670,081. INDUCTION-MOTOR-CONTROL SYSTEM; W. Seiz, Baden, Switzerland. App. filed April 16, 1926. Which will enable the induction machine torque to be controlled independently of speed.

1,670,083. TURBINE-REGULATING MEANS; R. G. Standerwick, Marblehead, Mass. App. filed April 20, 1927.

1,670,088. ELECTRIC SWITCH; L. S. Walle, Scotia, N. Y. App. filed Dec. 31, 1923. For reverse current or normal overload, the tripping of the switch being effective regardless of the position of the switch closing mechanism.

1,670,089. FLOW METER; J. Walsh, Swampscott, Mass. App. filed Nov. 5, 1926. With compensating means.

1,670,091. ELECTRICAL RECEPTACLE CONSTRUCTION; R. B. Benjamin, Chicago, Ill. App. filed March 9, 1923.

1,670,093. CONTROL SYSTEM; H. Bany, Schenectady, N. Y. App. filed June 17, 1924. For effecting a desired connection, such as a connection between the field winding of a synchronous machine and a suitable source of excitation, when a synchronous machine reaches synchronous speed after being started.

1,670,121. CIRCUIT BREAKER; E. D. Moore, Cleveland, Ohio. App. filed July 23, 1924.

Information on foreign patents can be obtained through the nearest district office of the Bureau of Foreign and Domestic Commerce, Department of Commerce.

New Trade Literature

UNIT PULVERIZER.—The Riley Stoker Corporation, Worcester, Mass., has issued a catalog which describes and illustrates the new improved "Atrita" unit pulverizer and gives information on the reliability, low maintenance, ability to handle wet coal and the sustained fineness of pulverization. The new Riley flare type burner also is described and illustrations are given showing many installations of the unit pulverizer.

REFRACTORIES. — Technical bulletin No. 20 issued by the Crescent Refractories Company, Curwensville, Pa., contains notes on the design of fire-clay shapes. Technical bulletins 1 to 19 inclusive, which contain charts, formulas and simple rules compiled for the use of persons interested in refractory linings also are available.

SHOP EQUIPMENT. — The Hobart Brothers Company, Troy, Ohio, is distributing a catalog covering the HB shop equipment, including the eight-hour battery chargers, electrical testing equipment, upright automatic air service, spray painting equipment, hydraulic car washers and ball bearing buffers and grinders.

PLUGS AND RECEPTACLES. — The Crouse-Hinds Company, Syracuse, N. Y., is distributing bulletin No. 2111, covering its type BP plugs and several types of plug receptacle condulets.

MOTORS.—Bulletins 504, 505, 506 and 502-A issued by the Louis Allis Company, Milwaukee, describe and illustrate respectively its slip-ring induction motors, its polyphase squirrel-cage motors, its single-phase squirrel-cage condenser motors and its inverted rotary converters. The bulletins cover the construction features. A number of illustrated applications are shown.

REFRIGERATOR CABINETS.—The Benjamin Electric Manufacturing Company, 128 South Sangamon Street, Chicago, is distributing a portfolio entitled "Building up Profits in Electric Refrigeration with Benjamin All-Porcelain Cabinets and the 1928 Sales Profit Plan." This portfolio describes a step-by-step method of building up a prospect list, the preparation of direct-by-mail and newspaper advertising, the development of sales follow-up, and presents an actual exhibit of the advertising material prepared by the Benjamin company for its distributors and dealers to use in selling all-porcelain cabinets for electric refrigeration. The company also has issued a catalog describing and illustrating its new line of all porcelain cabinets for electric refrigeration for apartment house installation.

Foreign Trade Opportunities

Following are listed opportunities to enter foreign markets. Where the item is numbered, further information can be obtained from the Bureau of Foreign and Domestic Commerce, Washington, by mentioning the number:

Purchase is desired in Sydney, Australia (No. 31,526), of hard-rubber battery containers, covers and vents.

An agency is desired in Luebeck, Germany (No. 31,533), for diaphragm sheets for telephones, loud speakers, etc.

An agency is desired in Munich, Germany (No. 31,531), for electric hand and hair driers.

Purchase or agency is desired in Gruenberg, Germany (No. 31,525), for electric hand driers.

An agency is desired in Mannheim, Germany (No. 31,528), for electrical hot-air drying apparatus, motor-driven household electrical appliances and electric washing machines.

An agency is desired in Dresden, Germany (No. 31,532), for electrical hot-air drying apparatus, and another (No. 31,504) for electric portable tools.

Purchase is desired in Amsterdam, Netherlands (No. 31,524), of electric floor polishers and electric washing machines.

An agency is desired in Port au Prince, Haiti (No. 31,522), for household electrical appliances and electric refrigerators, and another (No. 31,523) for household electrical appliances and electric refrigerators.

An agency is desired in Bradford, England (No. 31,536), for colored porcelain lighting fixtures and vacuum cleaners.